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Araucaria araucana and *Nothofagus* forest in the Conguillio National Park (Chile)

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The Parque Nacional Conguillío, Chile. The Parque Nacional Conguillío occupies 60.832 hectares in a mountainous area in Central Chile (Araucanía Region, Chilean Andes). An active volcano (Volcán Lalaima) lies in the middle of the park. The last eruption happened in 2008 and destroyed large portions of the surrounding forests. The vegetation is characterized by the presence of an impressive forest of *Nothofagus*: coigüe (*Nothofagus dombeyi*), roble (*Nothofagus obliqua*) and rauli (*Nothofagus alpina*) (Notophagaceae) mixed to several *Araucaria araucana*. Some gigantic trees (both *Nothofagus* and *Araucaria*) are found there. The volcanic landscape and the presence of several Araucarias gives the area a prehistoric look so that the park was the filming location of the 1999 BBC documentary "Walking with Dinosaurs".

Alberto Ballerio. Viale Venezia 45, 25123 Brescia, Italy; e-mail:alberto.ballerio@aballerio.it (photo Alberto Ballerio)

A lonely *Araucaria araucana* growing on an old lava

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On the taxonomic validity of *Lissochlamys perstriatula* (Sacco, 1897) (Bivalvia Pectinidae)

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ABSTRACT The discovery in the Spanish lower Pliocene of Moguer (Huelva, Spain), the Guadalquivir basin, of some valves corresponding to *Lissochlamys excisa* var. *perstriatula* Sacco, 1897 is reported. The comparison with the typical material preserved in the Natural History Museum of Turin (Italy) confirmed the correspondence between the Iberian and the Italian specimens. Due to the characteristics of the sculpture and the shape of the valves which clearly differentiate it from *L. excisa* (Bronn, 1831), this var. *perstriatula* is elevated to a valid species.

KEY WORDS Bivalvia; Pectinidae; Pliocene.

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INTRODUCTION

Malacological research conducted in the lower Pliocene of the Guadalquivir Basin, Sands of Huelva (southern Spain) (Fig. 1) allowed the discovery of some valves of a Pectinidae corresponding to *Lissochlamys excisa* var. *perstriatula* Sacco, 1897. This variety was described for the Pliocene, probably lower, of Astigiana (Asti, Piedmont, Italy) (Sacco, 1897). In the same places where *L. excisa* var. *perstriatula* was found in Spain, specimens of *L. excisa* (Bronn, 1831) have also been found. This species had previously been reported in the Guadalquivir Basin by some authors (see Porta de, 1969, 1979 and Landau et al., 2011 for the geological framework of the area).

MATERIAL AND METHODS

The examined material was collected manually on the ground, on the surface. The following abbreviations are used in the text: L = maximum width of the valve; es. = specimen with both valves; vl. = valve; MRSN = Regional Museum of Natural Sciences of Turin, Italy; CBM = Brunetti Mauro collection. For the systematics we followed the WoRMS (2019).

RESULTS

Systematics

Classis BIVALVIA Linnaeus, 1758
Subclassis PTERIOMORPHIA Beurlen, 1944
Ordo PECTINIDA Gray, 1854
Superfamilia PECTINOIDEA Rafinesque, 1815
Familia PECTINIDAE Rafinesque, 1815
Subfamilia PALLIOLINAE Korobkov, 1960
Genus *Lissochlamys* Sacco, 1897
Type species *Pecten excisus* Bronn, 1831

Lissochlamys perstriatula (Sacco, 1897) (Figs. 2–5)

Lissochlamys excisa var. *perstriatula* - Sacco, 1897: p. 46, tav. 13, fig. 29.
Palliolum (*Lissochlamys*) *excisum* Bronn - Raffi, 1970: p. 103, tav. 25, figs. 6a–c.

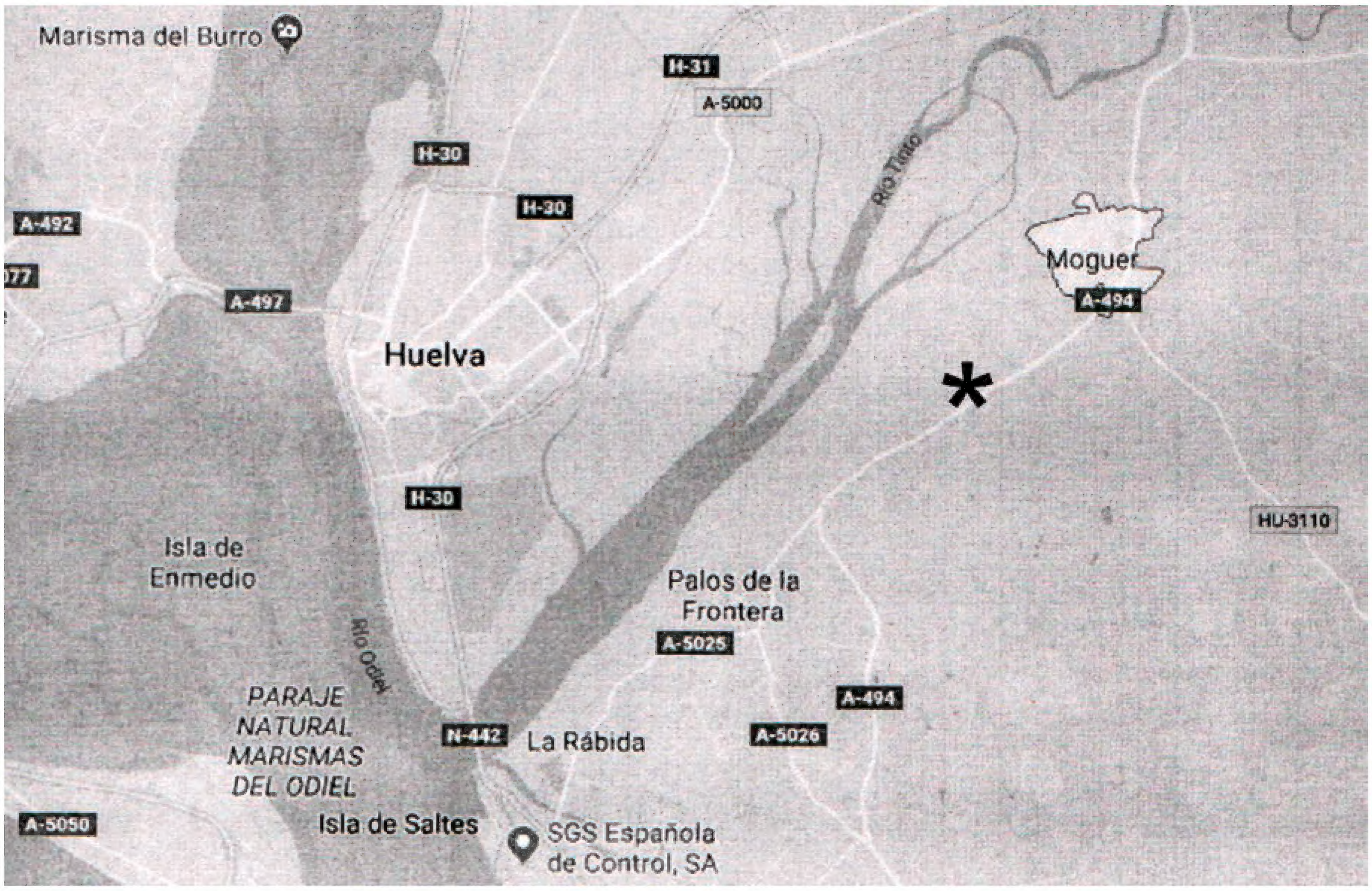

Marisma del Burro
H-31
A-5000
H-30
H-30
Río Tinto
A-492
A-497
Huelva
Moguer
A-494
*
H-30
HU-3110
Isla de Enmedio
Palos de la Frontera
Río Odiel
A-5025
PARAJE NATURAL MARISMAS DEL ODIEL
N-442
La Rábida
A-494
A-5026
A-5050
Isla de Saltes
SGS Española de Control, SA

Figure 1. Study area. The asterisk indicates the locality where *Lissochlamys perstriatula* (Sacco, 1897) was found.

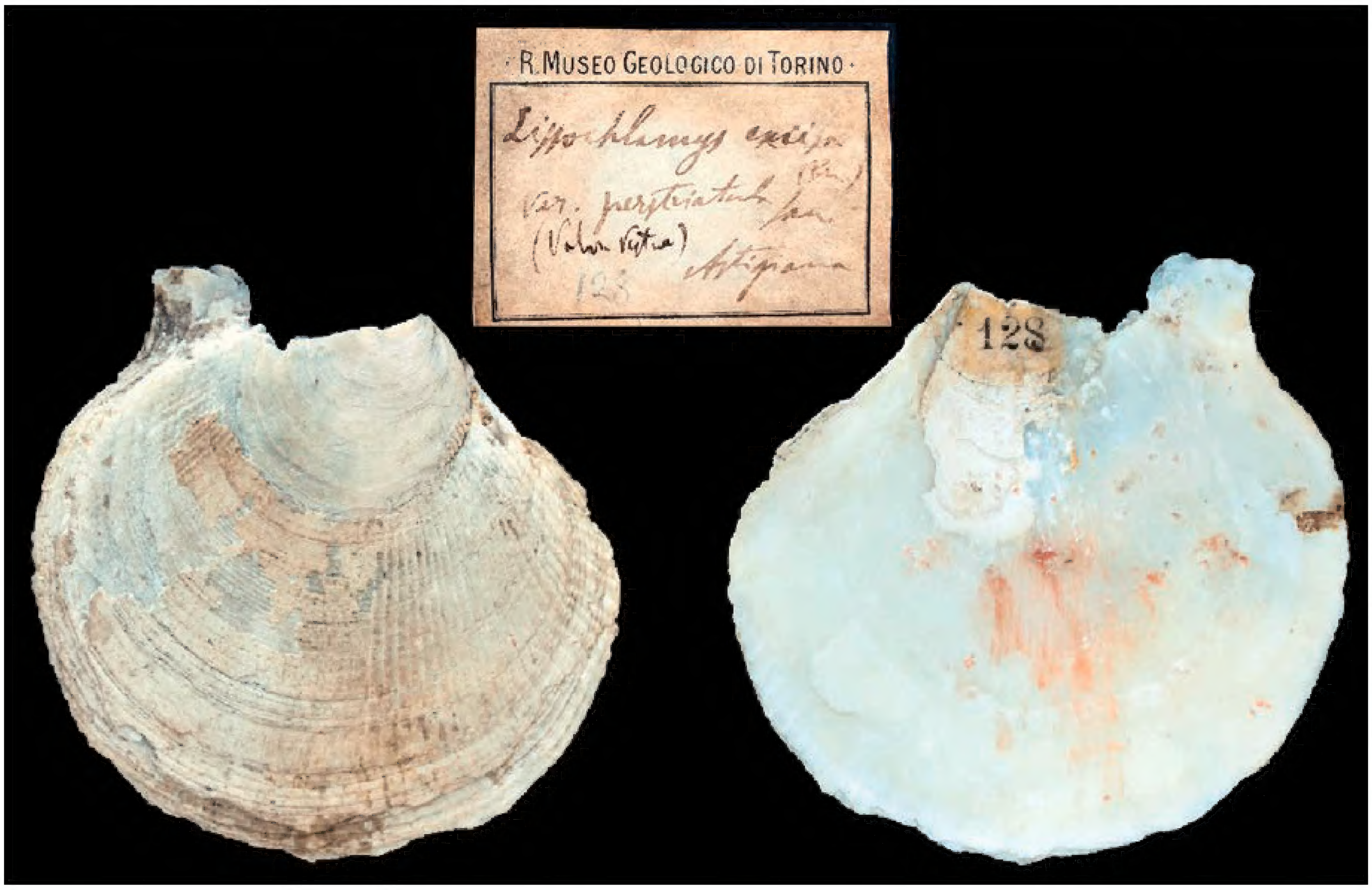
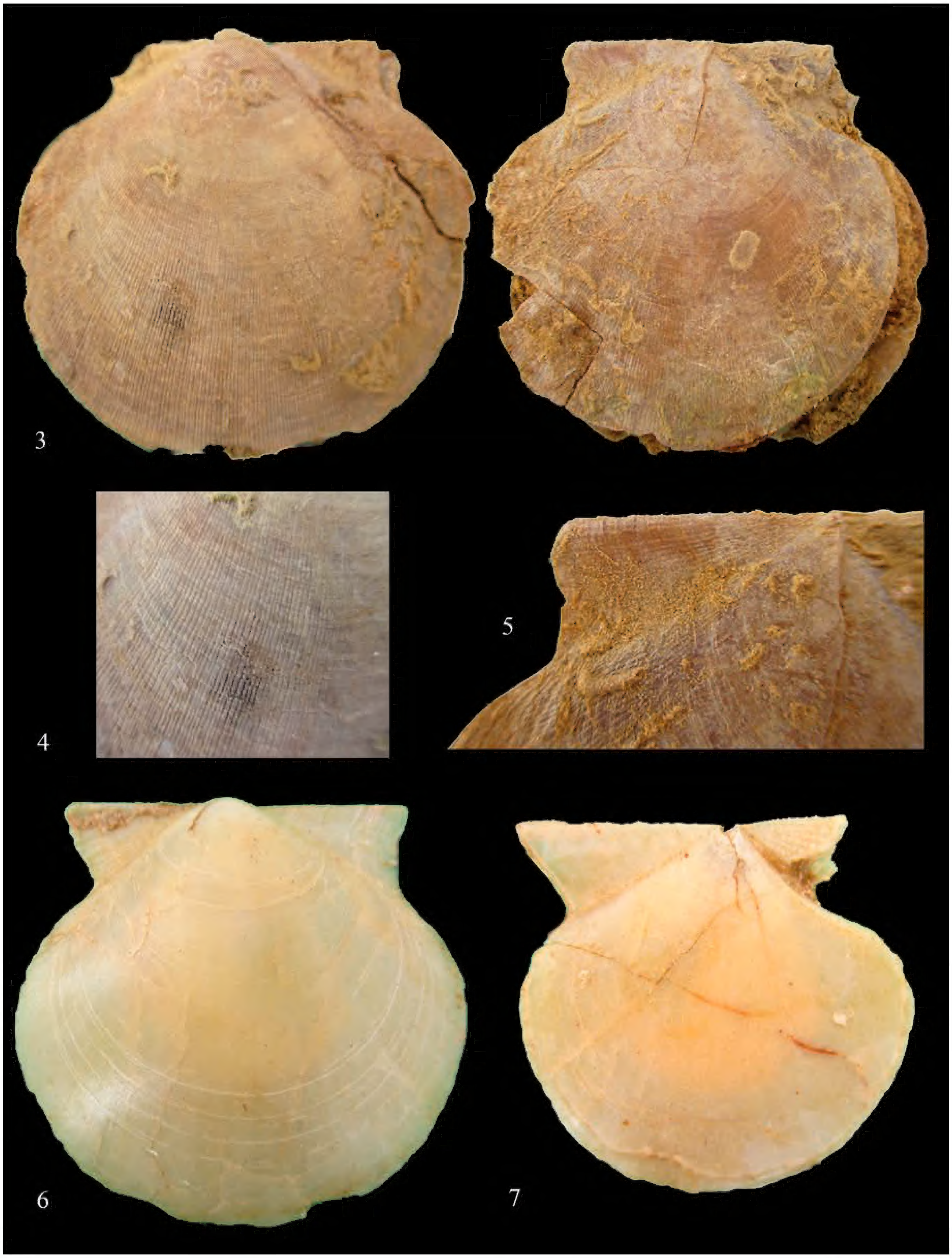

R. MUSEO GEOLOGICO DI TORINO
Lissochlamys excisa
var. perstriatula
Astigiana
128

Figure 2. *Lissochlamys perstriatula* (Sacco, 1897). Lectotipo, Astigiana, Pliocene, L = 34 mm, with original label.



Figures 3–5. *Lissochlamys perstriatula* (Sacco, 1897). Fig. 3: *Lissochlamys perstriatula*, Moguer (Huelva, Spagna) Zanclean, L = 55 mm (CBM). Fig. 4: Detail of the left valve sculpture. Fig. 5: Detail of the auricle left valve. Figures 6, 7. *Lissochlamys excisa* (Bronn, 1831). Fig. 6: Bonares (Huelva, Spagna), Zanclean, left valve L = 51 mm (CBM). Fig. 7: Bonares (Huelva, Spagna), Zanclean, right valve L = 49 mm (CBM).

Original description. Sacco (1897): "*Valva dextera radiatim striatior, in anteriore parte praecipue. Astiano: Astigiana (rara)*".

Examined material. Lectotype, Astigiana, Pliocene, 1 vl. (MRSN); Moguer (Huelva, Spagna), Zanclean, 1 es. + 3 vl. (CBM).

Lissochlamys exotica (Dyllwyn, 1817). 1 vl. Cassamance (Senegal).

Description. Medium-sized shell (L <80 mm), inaequivalved. Left valve slightly convex and inaequivalved, rigth valve completely flat and subequilateral. Orthodox umboni. Palleal margin is regularly rounded, subangular at the connection with the lateral margins which are slightly concave. Sub-equal auricles, little expanded. Ornamentation consisting of a dense radial sculpture in both valves and slender shallow growth streaks. Wide muscle footprint.

Remarks. Due to the unique morphological characteristics of *L. excisa* var. *perstriatula*, it is considered here as a valid species. The lectotype (Fig. 2) of this variety consists of a somewhat worn right valve which shows a slightly coarser radial streak than the material found in the Spanish Pliocene, but which, in my opinion, falls within the variability of this species. Following the description of this taxon (Sacco, 1897), Raffi (1970, p. 103, tav. 25, figs. 6a–c), illustrated a specimen also ascribable to *L. perstriatula*. This sample was found in the Pliocene (lower?) of Prato Otessola (Piacenza, Italy) (Cocconi collection) and it was illustrated and described as *L. excisa* (Bronn, 1831).

However, *L. excisa* has significant differences compared to *L. perstriatula* (see also the figures in Brambilla, 1976; Cavallo & Repetto, 1992; Chirli, 2014). In particular, *L. excisa* (Figs. 6, 7) is devoid of radial sculpture in both valves, except for a few weak radial stria just below the auricles. This species also has the more convex right valve and the different-shaped auricles, in particular those of the right valve (Fig. 7). Among the recent species, *L. perstriatula* has a certain affinity with *L. exotica* (Dyllwyn, 1817), a species present in the Senegalese province (see the figures proposed by Djikstra & Goud, 2002 and Ardovini & Cossignani, 2004), from which it differs in the right less convex valve and the radial sculpture clearly visible and present in both valves. In *L. exotica*, this type of ornamentation is composed of much thinner radial streaks, barely visible only in the lateral parts of both valves.

In conclusion, the variety *perstriatula* of Sacco (1897) must therefore be considered a valid species. The lectotype is the right valve of the Bellardi-Sacco collection with inventory number: BS-110-09-004.

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Genetic diversity of the Honeybee *Apis mellifera* Linnaeus, 1758 (Hymenoptera Apidae) from Jijel (Northeast Algeria)

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ABSTRACT Traditionally, subspecific classification and phylogeographic inferences in *Apis mellifera* Linnaeus, 1758 (Hymenoptera Apidae) were first classified according to their morphological and behavioral traits along with their geographical distributions. Morphometrical analyses conducted on large datasets have established different evolutionary lineages of honeybees. In the last two decades of honeybee genetic analysis and conservation, subsequent studies based on variations in mitochondrial DNA largely confirmed Ruttner's phylogeographic structure of *Apis mellifera*. However, very little is known about Algerian honeybee diversity. Therefore, this study assessed the genetic diversity of honeybees (*Apis mellifera*) in Northeastern Algerian, in North Africa, using the mitochondrial DNA marker (mtDNA) COI-COII (Cytochrome Oxidase I and II). In total, thirty honeybee workers were sampled from three sites of Jijel province. A PCR-RFLP (Polymerase Chain Reaction-Restriction Fragment Length Polymorphism) analysis of the mtDNA samples distinguished the honeybee evolutionary lineages from this region. Our study revealed that studied honeybee populations have A (African lineages) evolutionary group features. Notably, the northern Algerian honeybee populations had elevated diversity compared to the southern populations.

KEY WORDS Algerian honeybee populations; *Apis mellifera*; COI-COII intergenic region; Evolutionary lineage, Mitochondrial DNA marker.

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INTRODUCTION

Among insects, Apidae Linnaeus, 1758 (Hymenoptera) are the most important group of pollinators (Bénédicte, 2013) and *Apis mellifera* Linnaeus 1758 is the world's most widely distributed and well-known pollinator. It has naturally spread in Africa, Europe and Western Asia (Miguel et al., 2011), before they were spread around the world by many factors: natural migrations, adaptation to local conditions and some apicultural practices; such that the imports of queens, introduction of subspecies of foreign bees and the transhumance of colonies. These practices are therefore opposed to the forces exerted by natural selection that differentiates populations (Garnery et al., 1998a, b; Jensen et al., 2005). Based on morphometric characteristics, behavioral and biogeographical studies, 29 different honeybee subspecies have been identified (Ruttner et al., 1978; Ruttner, 1988; Sheppard et al., 1997; Sheppard & Meixner, 2003; Engel, 2004; Meixner et al., 2013) and are classified into five evolutionary lineages: (M) from Northern Europe and Northern Africa, (A) from South and Central Africa, (C) from the Northern Mediterranean region and Eastern Europe, (O) from the Eastern Mediterranean and the Near and Middle East regions, and (Y) from the eastern African country of Ethiopia. Subsequent studies based on variation in mitochondrial DNA (mtDNA) have largely confirmed this classification (Hall & Smith, 1991; Garnery et al., 1993; Arias & Sheppard, 1996; Franck et al., 2000; Cánovas et al., 2008; Kekecoglu et al., 2009; Alburaki et al., 2011; Papachristoforou et al., 2013; Loucif-Ayad et al., 2014; Achou et al., 2015).

Mitochondrial DNA markers have been widely used to address population and evolutionary questions in the honeybee *A. mellifera*. The characterization of the mtDNA genome has been very useful for analyzing the genetic structure of *A. mellifera* subspecies, as it contains regions with variable evolutionary rates and it is, generally, maternally inherited without recombination (Meusel & Moritz, 1993). Therefore, molecular markers have facilitated more robust assessments of honeybee diversity, such as the reclassification of North African subspecies, *A. mellifera intermissa* (Buttel-Reepen, 1906) and *A. mellifera sahariensis* (Baldensperger, 1932), into the African branch instead of the West European branch (Garnery et al., 1992).

The honeybee subspecies that are native to North Africa belong to the African lineage A (Ruttner, 1988; Garnery et al., 1995; Franck et al., 2001). In Algeria, two honeybee subspecies have been identified: *A. mellifera intermissa*, described by Buttel-Reepen (1906), is a breed of North Africa, found in Tunisia, Algeria and Morocco along the Mediterranean coast (Cornuet et al., 1988; Grissa et al., 1990); *A. mellifera sahariensis*, described by Baldensperger (1932; see also Haccour, 1960) ranges from Djebel Amour and Ain Sefra in Algeria through the oases of the Sahara south of the Atlas Mountains to Figuig in the west of Morocco (Ruttner, 1968; De la Rúa et al., 2007).

The used genetic marker in these studies was variation in the intergenic region between the cytochrome C oxidase I "COI" and II "COII" gene in mtDNA. It is unique to the genus *Apis* Latreille, 1802 (Cornuet & Garnery, 1991) as determined by restriction analysis "*DraI* restriction enzyme" (Garnery et al., 1993; Franck et al., 1998). This test has been widely used to analyze the evolutionary lineages of *A. mellifera* subspecies (Garnery et al., 1993; 1995; 1998 a, b; De la Rúa et al., 1998; Rortais et al., 2011). Using this method, different haplotypes can be distinguished and grouped into one of the five primary lineages described by Ruttner (1988) and reviewed by De la Rúa et al. (2009).

Studies were realized on the genetic biodiversity of *A. mellifera* in certain regions in Algeria (Chahbar et al., 2012; Loucif-Ayad et al., 2014; Achou et al., 2015; Hu et al., 2016).

The aim of this research was to analysis the genetic diversity of Algerian honeybee populations from three regions in the northeast (Jijel province) of the country. We used the COI-COII mtDNA marker (widely used in studies of honeybees) to identify the evolutionary lineages in our samples.

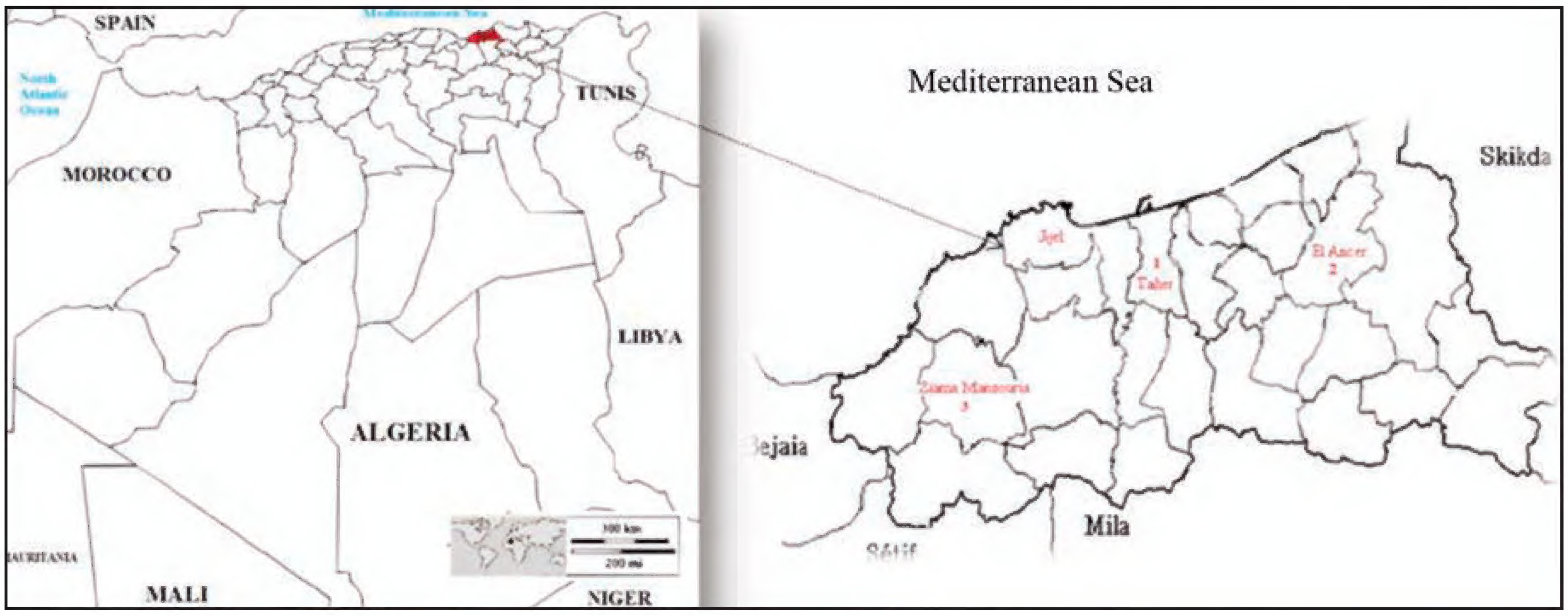

Figure 1. Sampling sites in the Jijel area (Algeria).

This work characterizes the mitochondrial genetic structure of the country's honeybee populations in Algeria.

MATERIAL AND METHODS

Honeybee samples

Thirty adult honeybees were sampled during autumn (October 2016) from three sites across Northeast Algeria (Jijel province). The geographical location and number of individuals sampled from each sites are shown in figure 1 and Table 1. This region spreading over an area of 2398,69 km^2, characterized by a Mediterranean climate (wet temperate) and per diverse vegetation (Greininger, 1982). Ten worker bees were sampled per site; preserved in absolute ethanol (90%) and stored at 4°C until DNA extraction.

DNA extraction

Genomic DNA was extracted from each bee's head according to the manufacturer's protocol (ZR Tissue & Insect DNA MiniPrep™Kit; Zymo Research, U.S.A). The head of the bees was crushed individually using mechanical homogenizer in a microcentrifuge tube then transferred to a ZR Bashing Bead™ Lysis Tubes. For optimal performance, β-mercaptoethanol supplemented the Genomic Lysis Buffer to a final dilution 0.5% (v/v). A Lysis Solution of 750 µl is added; with shaking by the vortex (10 min.); Lysis Tubes were centrifuged in a microcentrifuge (10000 x g/1min.). We transferred up to 400 µl supernatant to a Zymo-Spin™ IV Spin Filter in a Collection Tube and centrifuged (7000 x g/1 min.); we added 1,200 µl of Genomic Lysis Buffer to the filtrate in the Collection Tube from the previous step and mixed; Then, 800 µl of the mixture from the previous step are transferred to a Zymo-Spin™ IIC Column in a Collection Tube and centrifuge (10000 x g/1min.); the flow through from the Collection Tube was discarded and the previous step is repeated. We added 200µl DNA Pre-Wash Buffer to the Zymo-Spin™ IIC Column in a new Collection Tube and centrifuge it (10000 xg/1 min.), then 500 µl g-DNA Wash Buffer are added to the Zymo-Spin™ IIC Column and centrifuged (10000 x g/1 min.). Finally, the Zymo-Spin™ IIC Column are transferred to a clean 1.5 ml microcentrifuge tube and we added 30 µl DNA Elution Buffer directly to the column matrix; then the tubes were centrifuged (10000 x g/30s) to elute the DNA.

DNA quality and concentration were measured using a spectrophotometer (NanoPhotometerTM-Pearl, Implen GmbH, Schatzbogen, Germany); DNA isolated from each honeybee sample was subsequently stored at -20 °C for further genetic analysis.

Mitochondrial DNA analysis

In this study, we amplified the mtDNA COI-COII intergenic region located between the tRNALeu gene and the second subunit of the cytochrome oxidase gene II (COII) using the primer pair (Table 2) (Hall & Smith, 1991; Garnery et al., 1991; Smith et al., 1991; Garnery et al., 1993; Alburaki et al., 2011; Meixner et al., 2013).

PCR amplification of the COI-COII intergenic region was performed in a volume of 25 µl via a Thermal cycler C1000TM "CFX96 Real-Detection System, Bio-Rad, U.S.A". Thermal cycling was as follows: 3 min. initial denaturing at 92 °C, 30 cycles of denaturation at 92 °C for 1 min., annealing at 48°C for 1 min., and extension at 62 °C for 2 min., and a final extension step at 62 °C for 7 min.

Honeybee evolutionary lineage

In order to identify the evolutionary lineage of each individual, 2 µl of each PCR product was loaded into 1.4% agarose gel and electrophoresed along with the M7123-100bp DNA ladder marker (Biomatik, Germany). The gel was then stained for 10 min with ethidium bromide (EtBrat 0.5µg/ml) and finally observed under UV illumination. The length of the amplified mtDNA COI-COII intergenic region was measured for each sample, using the M7123-100bp DNA ladder marker (Biomatik, Germany).

Haplotype identification

The remaining 23 µl volume of each PCR product was digested with four units of the *DraI* restriction enzyme (Takara, Japan) at 37°C for 48 hours.

DNA patterns of each sample were observed under UV illumination and the images were saved in jpeg format for storage.

RESULTS

Restriction enzyme digestion of the mitochondrial fragment containing the intergenic region with *DraI* resulted in two different patterns assignable to the A mitochondrial lineages (African evolutionary lineage) as described by Cornuet & Garnery, (1991).

In *A. mellifera*, the COI-COII intergenic region varies from 192 to 832bp according on the subspecies. This variability depends on presence or absence of the P or P0 patterns and number of the repetition of the Q pattern (Table 3). Compared to the marker we used (M7123-100bp DNA ladder), the short pattern P0Q or PQ (among 500-600 bp) is dominant and represents 99% of our samples (site

	Locations	Geographical position		Number of worker bees sampled
		Latitude	Longitude	
	Jijel province	36° 49’00″ N	5° 46’00″ E	
1	El-Taher	36° 46′ 19″ N	5° 53′ 54″ E	10
2	El-Ancer	36° 48′ 00″ N	6° 09′ 25″ E	10
3	Ziama mansouriah	36° 40′ 25″ N	5° 28′ 52″ E	10
Total	**3 sites**			**30**

Table 1. Location and number of honeybees sampled (ten worker bees/site) for Jijel province studied in Algeria.

Primer sequence (5'-3')	
Forward	**Reverse**
E2 : 5’-GGCAGAATAAGTGCATTG-3’	**H2** : 5’-CAATATCATTTGATGACC-3’

Table 2. Primers used for Molecular characterization of COI-COII intergenic region from honeybees sampled.

Variant type	**Interpretation**	**Lineages evolutionary**
Ultra short	Q	C
Short	PQ or P_0Q	M ou A
medium	PQQ or P_0QQ	M ou A
Long	PQQQ or P_0QQQ	M ou A

Table 3. Structural organization of COI-COII mitochondrial region from honeybees samples.

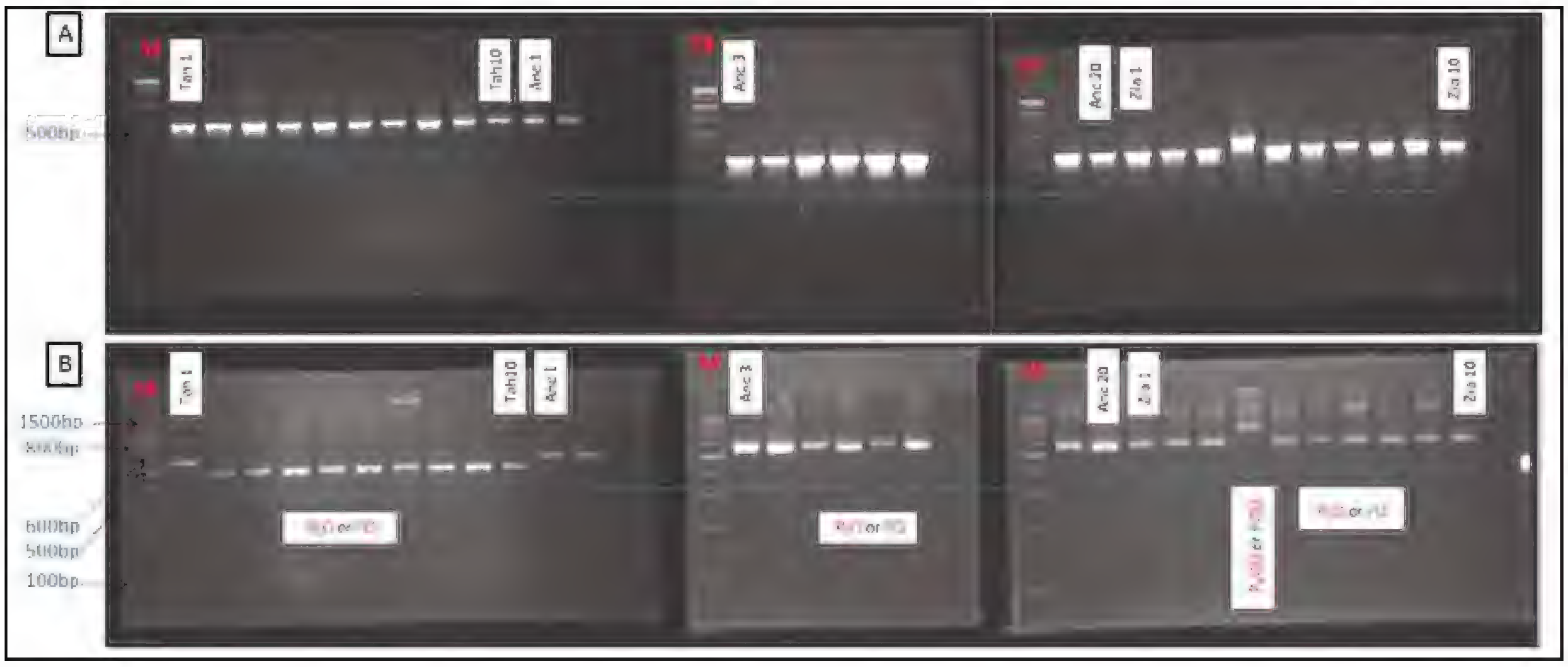

Figure 2. Visualization of different sizes of the COI-COII fragment on the agarose gel (M: M7123-100bp DNA ladder marker), lane Tah1-Tah10: Site 1 (El-Taher); lane Anc1-Anc10: Site 2 (El- Ancer); lane Zia1-Zia10: Site 3 (Ziama mansouriah); (A): Before digestion with *DraI* restriction enzyme; (B): After digestion with DraI restriction enzyme.

1 and 2), the samples from Ziama mansouriah were characterized by medium pattern P0QQ or PQQ, having a low percentage 1%, which coexists with the short pattern P0Q or PQ (Fig. 2).

DISCUSSION

Our study was based mainly on the COI-COII mtDNA marker in order to characterize the genetic variability of the Algerian honeybee populations on a large geographical scale. The COI-COII intergenic mtDNA region had different lengths in the studied populations. Among our samples, the size range was detected between 500bp and 800bp on agarose gel (1.4%) (Fig. 2) compared to the marker we used (M7123-100bp DNA ladder).

As expected from previous results (Cornuet et al., 1991; Garnery et al., 1993, 1995; Franck et al., 2001), this study has shown that Algerian honeybee populations correspond to the African evolutionary lineage. A comparison of the genetic variability between the Algerian populations and Tunisian honeybee populations (Chouchaine, 2010) revealed the presence of three types of restriction fragment P0Q or PQ, P0QQ or PQQ and Q. But, P0Q or PQ variant is a majority and represents about 94.66% of all variants of the Tunisian bees, identification of this profiles by DraI restriction enzyme revealed existence of four African haplotypes A1, A4, A8 and A9; based on this polymorphism, Tunisian honey bees belong to African lineages.

Previous studies have demonstrated similar results in Algerian honeybee populations (Chahbar et al., 2012) in which African haplotypes were strongly dominant despite past importations of European honeybees. These results are highly consistent with those based on prior microsatellite analysis of the honeybee samples (Loucif-Ayad et al., 2014); the data of Achou et al. (2015) revealed the presence of three different honeybee lineages among the studied populations, comprising the African (A) lineages, North Mediterranean (C) and West Mediterranean (M) whose eight different mtDNA haplotypes (A1, A2, A8, A9, A10, A13, C7 and M4).

CONCLUSIONS

In conclusion, our data demonstrated that Algerian honeybee populations belong to the African (A) lineage. According to our research, there is no introgressions (importation of foreign honeybees) among these populations were recorded, which can cause an impact on the genetic diversity of local honey bees. Expanding the sampling to the Algerian honeybee populations is of major importance, as it will allow a better understanding of the diversity. From a conservation point of view, limiting foreign queen importations to preserve the local genetic diversity of the Algerian honeybee populations is needed.

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Cybister tripunctatus africanus (Castelnau, 1834) (Coleoptera Dytiscidae): first record for Lampedusa Island (Pelagie Islands, Sicily Channel)

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ABSTRACT The authors report the first record of the Dytiscidae *Cybister tripunctatus africanus* (Castelnau, 1834) for Lampedusa Island (Sicily Channel, Italy), which also represents the first finding of an acquatic insect belonging to Coleoptera Dytiscidae in this island.

KEY WORDS Coleoptera; Dytiscidae; Lampedusa.

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INTRODUCTION

Cybister tripunctatus africanus (Castelnau, 1834) (Coleoptera Dytiscidae) is a species with southern-Mediterranean-Ethiopian spread, known in Italy in Friuli Venezia Giulia, Lazio, southern regions, Sicily and Sardinia (Franciscolo, 1979; Angelini, 1984).

Aquatic and predatory species, even at the larval stage, it lives in retro-dune ponds, mouths and residual pools of small streams, preferably on muddy substrates (Franciscolo, 1979). *Cybister tripunctatus africanus* is also an excellent flyer.

In Sicily, it is a quite widespread species, at medium and low altitudes, in natural and artificial waters (Sparacio, 1995). Ragusa (1887) already indicated it as: "*... comunissima specialmente nel lago di Lentini* [very common especially in Lake Lentini] ...".

Also present in Tunisia (Touaylia et al., 2010), this species is not known in Lampedusa where, according to Romano (1995), the almost total lack of natural humid environments did not allow the establishment of a permanent population of Ditiscid insects.

DISCUSSION AND CONCLUSIONS

On September 3rd, 2019 an adult female specimen of *C. tripunctatus africanus* was found in Lampedusa, in Contrada Piddu. The insect was inside the room of a hotel, overlooking the property's garden.

The discovery of this unique specimen suggests that the insect has flown over the island, presumably transported by favourable winds from North Africa. In fact, it is not the first time that in Lampedusa there have been reports of insects that have flown or been carried by the wind as for *Campalita algirica* (Géhin, 1885) and *C. olivieri* (Dejean, 1831) (Casale et al., 1982 and Vigna Taglianti, 1995; see also for Sicily: Monastra, 1984; Aliquò & Castelli, 1991; Sparacio, 2003) or by active immigration, as in the case of the Orthoptera *Brachytrupes megacephalus* (Lefebvre, 1827) and *Schistocerca gregaria* (Forskål, 1775) (Prazzi et al., 2014).

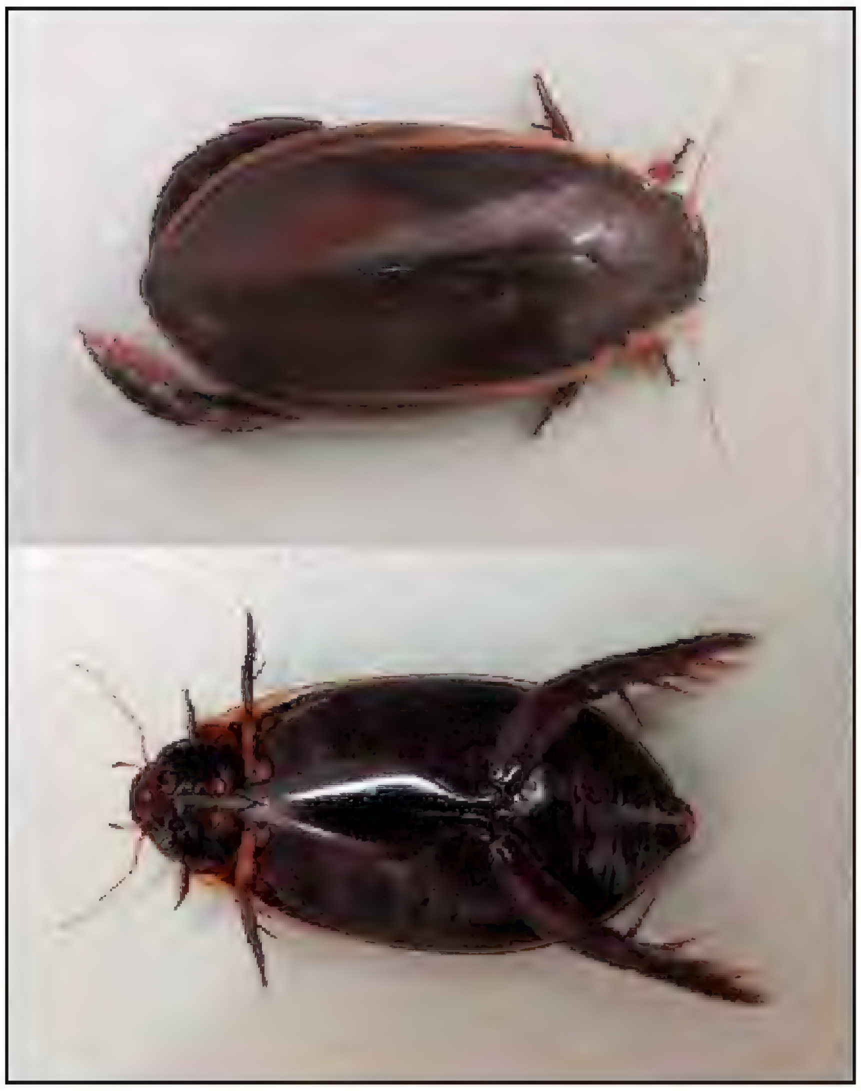

Figure 1. *Cybister tripunctatus africanus* from Lampedusa Island, Italy.

Following this finding, it is considered appropriate to deepen the research of further specimens of *Cybister tripunctatus africanus* to evaluate whether a stabler settlement of this species is present in Lampedusa.

In particular, the research of this species, but also of other aquatic Coleoptera, will be carried out in correspondence with reservoirs, artificial tanks and in the temporary pools that form inside cavities of karst rocks used in Lampedusa as reproductive sites by the African green toad, *Bufo boulengeri* Lataste, 1879 (Lo Valvo et al., 2017).

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First record of *Okenia problematica* Pola, Paz-Sedano, Macali, Minchin, Marchini, Vitale, Licchelli et Crocetta, 2019 (Gastropoda Nudibranchia Goniodorididae) for Sicily (Ionian Sea, Italy)

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ABSTRACT *Okenia problematica* Pola, Paz-Sedano, Macali, Minchin, Marchini, Vitale, Licchelli & Crocetta, 2019 (Gastropoda Nudibranchia Goniodorididae) is here reported for the first time for Sicily. The Mediterranean species of the genus *Okenia* Menke, 1830 have recently undergone a taxonomic revision that has reduced the number of species from eight to six because in the past some species were misidentified. For this reason, this new species was described for the Mediterranean. In this short paper, two specimens of this species were found in two nearby areas of Catania (Ionian coast of Sicily) that are strongly anthropized. Therefore, we believe that this species is tolerant to polluted waters.

KEY WORDS Goniodorididae; new record; Nudibranchia; *Okenia problematica*; Sicily.

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INTRODUCTION

The genus *Okenia* Menke, 1830 (Gastropoda Nudibranchia Goniodorididae) has a worldwide distribution with 62 species (MolluscaBase, 2019). The species of this genus have a broad body, flattened oral veil, mantle ridge reduced, bearing a variable number of elongated papillae. Similar papillae may be present on the central part of the dorsum (Thomson & Brown, 1984). According to Pola et al. (2019), in the Mediterranean Sea there are six valid species: *O. aspersa* (Alder et Hancock, 1845), *O. elegans* (Leuckart, 1828), *O. hispanica* Valdés et Ortea, 1995, *O. mediterranea* (Ihering, 1886), *O. longiductis* Pola, Paz-Sedano, Macali, Minchin, Marchini, Vitale, Licchelli et Crocetta, 2019, and *O. problematica* Pola, Paz-Sedano, Macali, Minchin, Marchini, Vitale, Licchelli et Crocetta, 2019. These latter two species have been recently described, in view of a taxonomic revision of this genus in the Mediterranean Sea (Pola et al., 2019). In fact, in previous studies, some species recorded for the Mediterranean basin, in particular *O. impexa* Er. Marcus, 1957 and *O. cupella* (Vogel et Schultz, 1970), were repeatedly misidentified. This misidentification could be related to the external similarities, such as the color pattern and the characteristic tip of the papillae (Pola et al., 2019). *Okenia impexa* and *O. cupella* are valid species in their type localities that are located in the western Atlantic Ocean. Nevertheless, they were sometimes considered as synonyms and Mediterranean Sea records were assigned to one or the other taxon, according to different authors. *Okedia cupella* was described by Vogel &

Schultz (1970) in York River (Virginia, Atlantic Ocean). In the Mediterranean Sea, the reports ascribed to this species were in Spain: Cabo de Palos (Valdés & Ortea, 1995), Islas Columbretes (Templado et al., 2002), and Estrecho de Gibraltar (Valdés & Ortea, 1995; García-Gómez et al., 2011); and in Italy: Ischia (Sordi, 1974 as *O. pusilla*). On the other hand, *O. impexa* was described by Er. Marcus (1957) in São Sebastião (Brasil, Atlantic Ocean). The Mediterranean Sea records ascribed to this species were in Spain: Cabo de Palos (Templado, 1982) and L'Escala (Ballesteros et al., 2016); in France: Banyuls-sur-mer (Schmekel, 1979; Schmekel & Portmann, 1982 as *O. impexa banyulensis* Schmekel, 1979); and in Italy: Naples (Schmekel, 1979 as *O. impexa banyulensis* Schmekel, 1979).

According to Pola et al. (2019), all Mediterranean Sea records of both species are now ascribed to a single entity, that is *O. problematica*. This new taxon has been recently described by Pola et al. (2019) from specimens collected in Gallipoli (Italy), Aiguafreda (Spain) and Cala Joncols (Spain).

The aim of this note is to document the first record of *O. problematica* in Sicily.

MATERIAL AND METHODS

Two specimens of *O. problematica* were found in different sites of the Ionian coast of Sicily (Italy): one individual was found in a station near Ognina (Catania) (37°31'49.1"N - 15°07'14.8"E) and the other one in a station called Cannizzaro (Catania) near the Lido Bellatrix (37°32'03.98"N - 15°07'34.12"E). The area where the first specimen was found is characterized by rocky boulders of different sizes and small inlets covered with a sciaphilous assemblage. The other site where the second specimen was found is characterized by a rocky steep slide with sciaphilous organisms. Both areas are strongly anthropized. In fact, at Ognina there is a harbor and in both sites there are many bathing establishments and apartment buildings. Both individuals were photographed with an Olympus TG4 underwater camera.

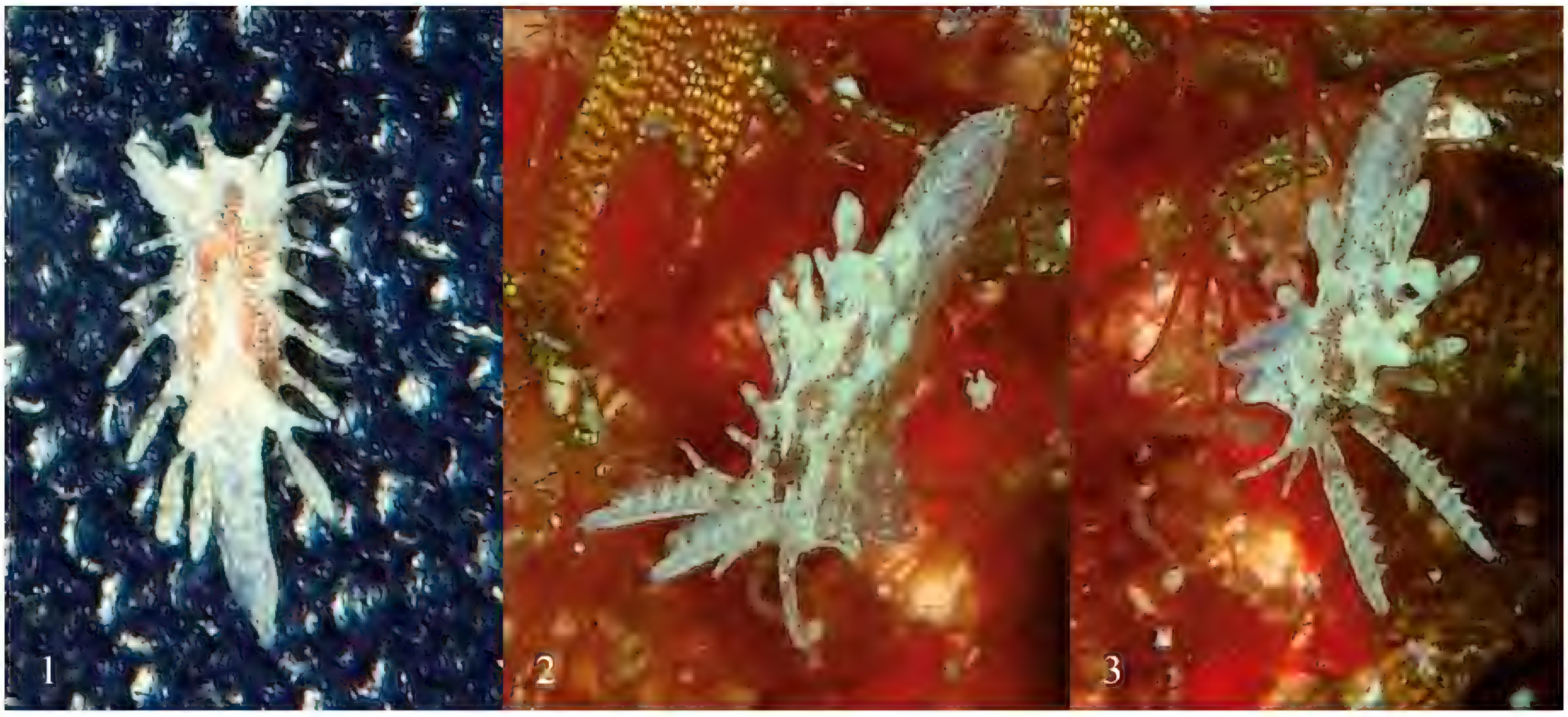
RESULTS

The first specimen (Figs. 1–3) was seen on 11th May 2019 near Ognina, at 17.4 mt depth. It was found on a rocky boulder covered by photophilous algae, such as *Halopteris scoparia* (Linnaeus) Sauvageau. This individual had an elongated body with eight papillae symmetrically distributed on each side of the notum ridge. Papillae were located in this way: in front of rhinophores there were two elongated papillae with a proximal part larger than the distal one; two papillae, at the same level of rhinophores, similar to the previous ones; 4 papillae, between rhinophores and gills, that became longer towards the back and had a more rounded tip, going backwards; two papillae, behind the gills, arising from the same stalk and larger than the previous ones. Among them, one of the right side was smaller than the fellow, because probably it had been previously lost. Another papilla arose alone in front of the gills and was the smallest of the ones hitherto described. Rhinophores bore seven lamellae backwards. Gills were composed of four branches, two anterior and two posterior. The individual had a white translucent body, a pattern of brown spots on the notum, absent on the ridge, between the central papilla and gills. The gills were slightly yellowish.

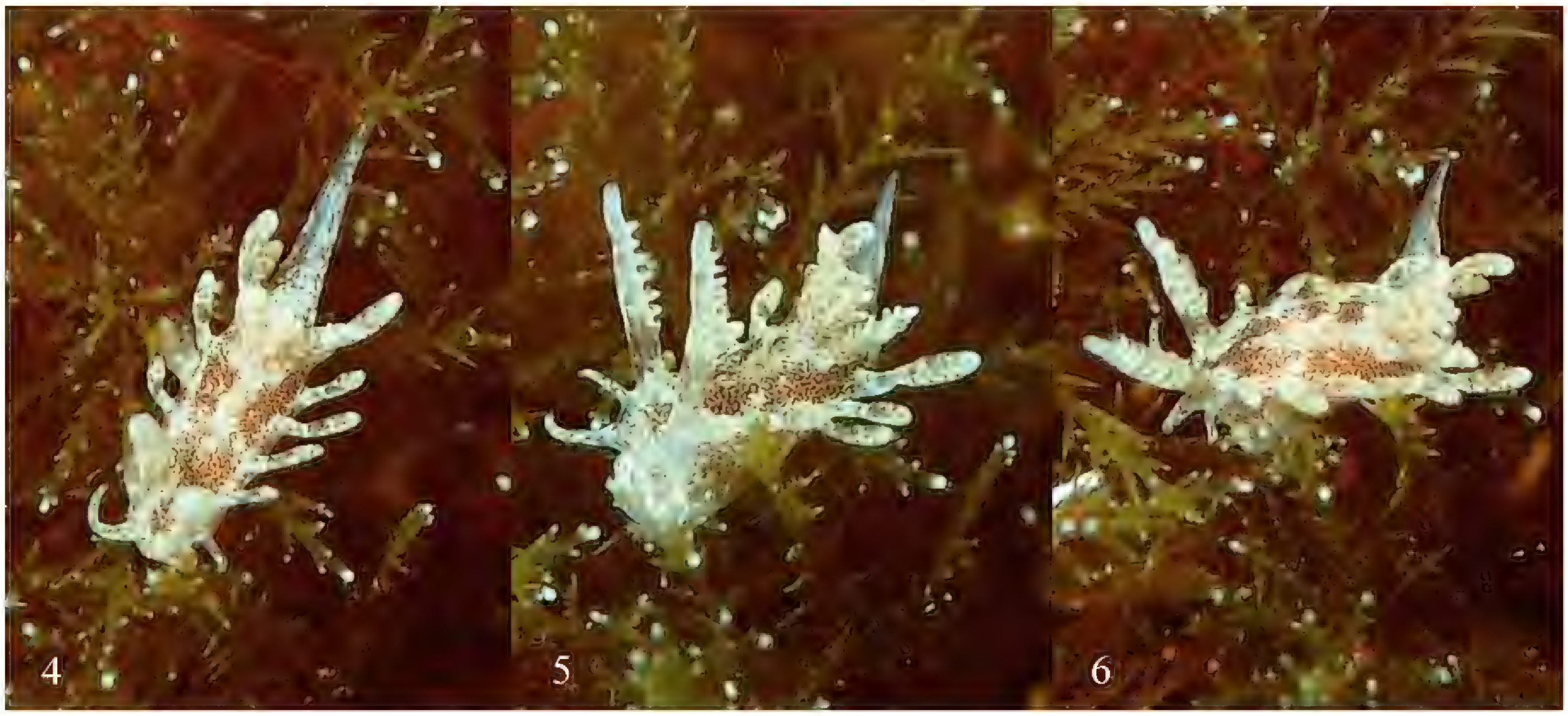
The second specimen (Figs. 4–6) was seen on 19th May 2019 near the Lido Bellatrix, at 14.5 mt depth. This individual was found above a stone covered by *H. scoparia*. This specimen was similar to the one found near Ognina, except for two characteristics: the brown pattern which continued beyond the notum, up to half of the sides of metapodium; the absence of one of the last two papillae behind the gills on the left side of the body. Both specimens were photographed "*in vivo*" and had the same main characteristics of the individuals described by Pola et al. (2019) for *O. problematica*.

DISCUSSION

These two reports represent the first record of *O. problematica* for Sicily (Ionian Sea, Italy). Both individuals were found in nearby areas, that are strongly anthropized. Moreover, both specimens were seen almost at the same depth and were both on the same substratum, characterized by the alga *H. scoparia*. Therefore, we believe that *O. problematica* is an euriecia species, tolerating polluted



Figures 1–3. Specimen found near Ognina (Catania, Italy). Fig. 1: dorsal view. Fig. 2: lateral left view. Fig. 3: posterior view (photos by A. Lombardo).



Figures 4–6. Specimen found near Lido Bellatrix (Catania, Italy). Fig. 4: dorsal view. Fig. 5: anterior view. Fig. 6: lateral left view (photos by A. Lombardo).

waters with a high rate of sedimentation, due to the proximity of the harbor and the coastal exploitation. In fact, we have never found this species in areas of the Ionian coasts of Sicily that are less polluted. Moreover, the other specimens reported in Pola et al. (2019) were found in areas close to cities, which host big harbors. In the previous reports, *O. problematica* was always found in the infralittoral zone (Schmekel, 1979; Schmekel & Portmann, 1982; Templado, 1982; Valdés & Ortea, 1995; García-Gómez et al., 2011; Ballesteros et al., 2016; Pola et al., 2019). Even the specimens seen by us were found in the infralittoral zone on a rocky bottoms covered by *H. scoparia*. We think that on this seaweed could live bryozoans which could represent the source of food of *O. problematica*. Finally, we feel that probably this species were already present along the coasts of Sicily, but its cryptic appearance has always making its findings difficult.

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Community monitors as researchers: determining vulnerable species distribution in a protected area of central Mexico

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ABSTRACT We designed a training workshop in biodiversity monitoring and natural resources management and conservation for rural communities of the Hydrographic Basin of the Necaxa River Protected Area, aiming to increase active participation. We presented 2 cases in which participants documented 2 vulnerable species, increasing the distribution of margay, *Leopardus wiedii* Schinz, 1821 (Mammalia Felidae) and recording the persistence of neotropical otter, *Lontra longicaudis* Olfers, 1818 (Mammalia Mustelidae). These records proved that with proper training, community monitors could generate new information on biodiversity distribution, provide evidence to traditional knowledge, and produce data to improve protected area management.

KEY WORDS Citizen science; *Leopardus wiedii*; *Lontra longicaudis*; Necaxa River; Puebla.

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INTRODUCTION

Public participation in scientific projects can provide a significant input as it can help to determine different aspects whether from species (Gandiwa, 2012; Petracca et al., 2014; Kotschwar et al., 2015) or ecosystems and the use of natural resources (De la Ossa et al., 2011). However, participation varies among different projects according to their necessities. As in protected areas, capacities vary among communities; we developed a workshop for key participants covering biodiversity monitoring and management, project administration, and legislation. We aimed to generate facilitators in each community in order to increase interest in biodiversity conservation inside protected areas. In this paper, we present two cases in which community monitors have undertaken biodiversity monitoring methodologies to document range expansions of margay (*Leopardus wiedii* Schinz, 1821) and persistence of otter (*Lontra longicaudis* Olfers, 1818) in the Necaxa River.

We developed the workshop in the protected area “Cuenca Hidrográfica del Río Necaxa” in Central Mexico (between the parallels 20°3´ and 20°14´ of latitude north and 97°51’ and 98°13’ of west longitude). It has a very marked altitudinal variation that goes from 560 meters a.s.l. up to 2,323 meters a.s.l. and a considerable variation of ecosystems: pine forests, oak forests, pine-oak forests, mountain mesophile forests and medium sub-deciduous forests (Cerón-Carpio et al., 2012). The cases we present correspond to a community in conserved pine forests with isolated patches of medium sub-deciduous forests (Parque ecológico “La Venta”) and one community in evergreen tropical forest (El Pozo).

MATERIAL AND METHODS

As part of the workshop, we included how to use camera traps, undertake transects to determine the presence of tracks and scats according to Aranda (2000). We provided each community with 2 Bushnell Natureview camera traps that were set along paths at the height of about 30 cm to 40 cm and changed every 15 days, from February to July 2018.

In this work, we present the report of each species.

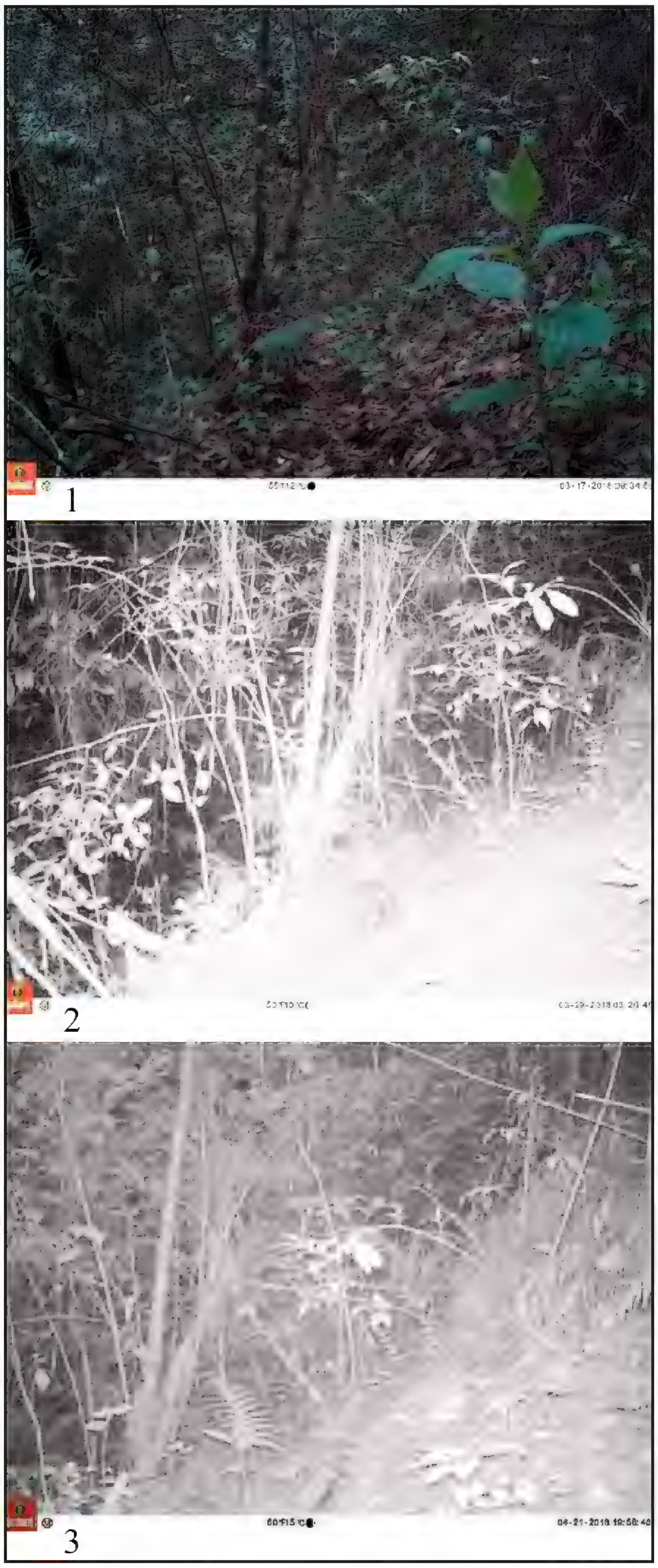
RESULTS AND CONCLUSIONS

The animal species registered with this photographic survey system are the following:

1. **Margay (*Leopardus wiedii*)**

Monitors from the community of Venta Grande set camera traps in the Ecoturistic Park La Venta accumulating a total of 579 camera/nights. During this period, monitors obtained photos of three individuals of undetermined sex in nearby areas in the days: 17 March 2018 at 09:34, 29 March 2018 at 03:26 and 21 April 2018 at 19:56 (Figs. 1–3). The individuals were identified thanks to their size in the photographs, the spot patterns, and the tail-body relation (Aranda, 2000; De Oliveira, 1998; De Oliveira et al., 2015).

Additionally, we recorded other mammal species such like Cacomixtle, *Bassariscus astutus* (Lichtenstein, 1830) and Raccoon, *Procyon lotor* (Linnaeus, 1758) (Procyonidae), Opossum, *Didelphis virginiana* (Kerr, 1792) (Didelphidae), Grey Fox, Grey Chipmunk, *Sciurus* spp. (Sciuridae), *Urocyon cinereoargenteus* (Schreber, 1775) and Feral Dogs (*Canis familiaris* Linnaeus, 1758 (Canidae). The Margay was previously reported in the state (Botello et al., 2006; Ramírez-Bravo & Hernandez-Santin, 2016); however, our records are important for the reserve as they extend the distribution of the species 25 km to the west of the nearest report inside the protected area (Ramírez-Bravo & Hernandez-Santin, 2016). Furthermore, it is the first time in the area that a margay is spotted above



Figures 1–3. Margay (*Leopardus wiedii*) records obtained with camera trap.

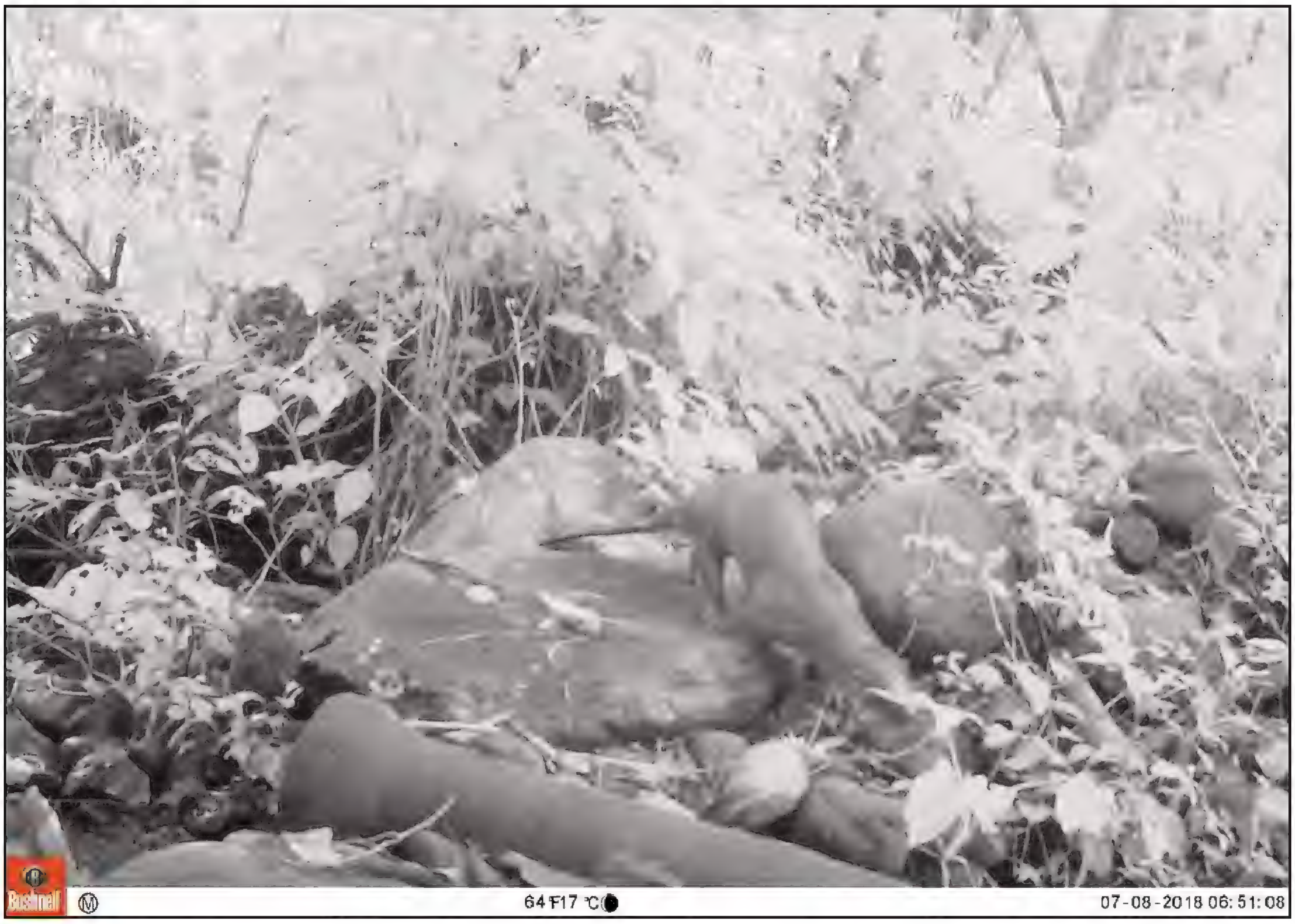


Figure 4. Otter (*Lontra longicaudis*) obtained by camera traps.

the 2,000 meters a.s.l. in an area with pine forest as predominant habitat. In terms of management, the use of camera traps has helped to determine species presence and illegal hunting occurring inside the Ecotouristic Park.

2. **Otter (*Lontra longicaudis*)**

Community monitors from the municipality of Zihuateutla set camera traps in tropical rainforest, accumulating a total of 300 camera/nights. During this period, monitors obtained a photo of an Otter of undetermined sex near the Necaxa river on 8 July 2018 at 06:51 (Fig. 4).

Additionally, we recorded other mammal species such as Coati, *Nasua narica* (Linnaeus, 1766), and Raccoon *Procyon lotor* (Procyonidae) and Opossum, *Didelphis virginiana* (Didelphidae). Although the record is not new to the zone (Ramírez-Bravo & Hernandez-Santin, 2016), it shows that the otter continues using the available habitat along the river.

ACKNOWLEDGEMENTS

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Regional phytogeographic analysis of the flora of the Mounts of Saida (western Algeria): evaluation-restoration report

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ABSTRACT A regional floristic and phytogeographic study was conducted in the Mounts of Saida, a sub-sector of the Tell Atlas (Oran) (O3), in the western Algeria. On an area of 56.31 Km^2 surveyed regularly over time during the springs and autumns from 2017 to 2019. A total of 344 taxa divided into 77 families and 223 genera, including 18 new (exogenous) for Tell Atlas (Oran) sub-sector (O3), have been inventoried. Of these 18 species, 8 belong to the phytogeographic areas of the arid (H) and hyperarid (AS) regions and 2 invasive species that reinforce and confirm theories of plant dispersal to the north and to high altitudes for adapting to climate change. The Factor Analysis of Correspondences (F.A.C) shows that species distribution is the result of local microclimates associated with the elevation; particularly, the mountains facing north receive a significant amount of humidity from the Mediterranean Sea.

KEY WORDS Analysis; climate change; Dispersal; Mounts of Saida; Regional phytogeographic.

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INTRODUCTION

Phytogeographic and Chorological studies are a very important basis for any conservation and restoration attempt of the local flora (Quezel, 1999). They allow us to know the natural history of a given region and they are a true model for interpreting the phenomena of ambiental regression (Olivier et al., 1995).

According to Molinier (1934), two points of view remain attached to this distribution: 1) how a particular species live in a specific habitat and if it can be introduced in another region; 2) how the flora has developed itself and its behavior towards local ecological factors in a region over time, considering that the conditions of the environment changes through the ages.

The floristic sectors and subsectors subdivision is a reflection of the narrow climate-vegetation dependence based on the phytogeographic division of Barry et al. (1974).

Among these, there are phenomena of regression and global warming at the regional level.

The effect of climate change on biodiversity in general, including vegetation, has been and continues to be the subject of interest to several authors, including Singh & Wheaton (1991), Brooks et al. (1998), Hebda (1998), Thompson et al. (1998), Hansen & Dale (2001), Li et al. (2000), Kirschbaum (2000), Malcolm et al. (2002), Chuine et al. (2004), Callaghan et al. (2005), Gray (2005), Juday et al. (2005), Usher et al. (2005), Hamman & Wang (2006), Mckenney et al. (2007) and Aitken et al. (2008).

As the climate changes occur, some animal and plant species may evolve to adapt to new environmental conditions, while others may move their range to areas and regions that are more suited for their survival, for example, high altitudes. Such a phenomenon of displacement, known as "dispersal", is an important natural adaptation mechanism. In this context, Callaghan et al. (2005) report that "*The expected increase in temperatures will increase plant productivity and change the range of floristic species. More widespread species will see their range expand northward with greater abundance and species exclusive or mainly those from higher latitudes will see their ecological niche shrink. The latitude and amount of light will limit the northward migration of some plant species despite rising temperatures. The cumulative effects of climate change on certain factors are likely to lead to the emergence of new phytocenoses, with different taxonomic structures and compositions*".

Usher et al. (2005) report that: "*Climate change should affect biodiversity by changing species range and habitats, species abundance, genetic diversity and species behavior migratory species and the introduction of exotic species*".

To summarize: climate change will produce new ecological niches that will encourage the emergence of new species on a given site. For the majority of species, climate-friendly biotopes will move northwards and will rise at high altitudes. The range of species adapted to hot and dry climates will extend to areas that are currently occupied by species better adapted to cool climates and, therefore, there will be changes in floristic composition, species distribution, age class distribution and ecosystem structure.

The Mounts of Saida belong to the Holarctic Empire, the Mediterranean region, the Eu-Mediterranean sub-region, Mediterranean Maghrebian domain, the Oran sector (O) and the Tell Atlas (Oran) subsector (O3) (Quézel & Santa, 1962–1963).

The first research in western Algeria was that of Babali et al. (2014) in the Tlemcen region. This work shows the emergence of 9 new plant species (exogenous) for O3, but which have been observed in other biogeographical sectors including arid and hyperarid regions.

The objective of this study is to contribute, in addition to the aforementioned study (Babali et al., 2014), with the proposal for a new list of the flora of Tell Atlas (Oran) subsector (O3) with a complete inventory of plants and on the basis of literature data (Quézel & Santa, 1962–1963).

MATERIAL AND METHODS

Study area

The natural forests of Doui Thabet located to the west of the mounts of Saida are part of the biogeographic subsector of the Tell Atlas (Oran) (O3). They cover an area of 56.31 Km^2 (Fig. 1). She is characterized by a semi-arid climate where the average annual rain fall range from 300 mm to 350 mm. January is the coldest month with a minimum of 2°C, and the warmest month, with maximum averages of 35°C. The area is characterized by a dry and warm period from April to October, and another rainy and cold from November to March.

According to the numerical model of the terrain (N.M.T), the area has a very heterogeneous and rugged terrain, its altitude is between 580 m and 1203 m.

Methods

The principle of this work is based mainly on

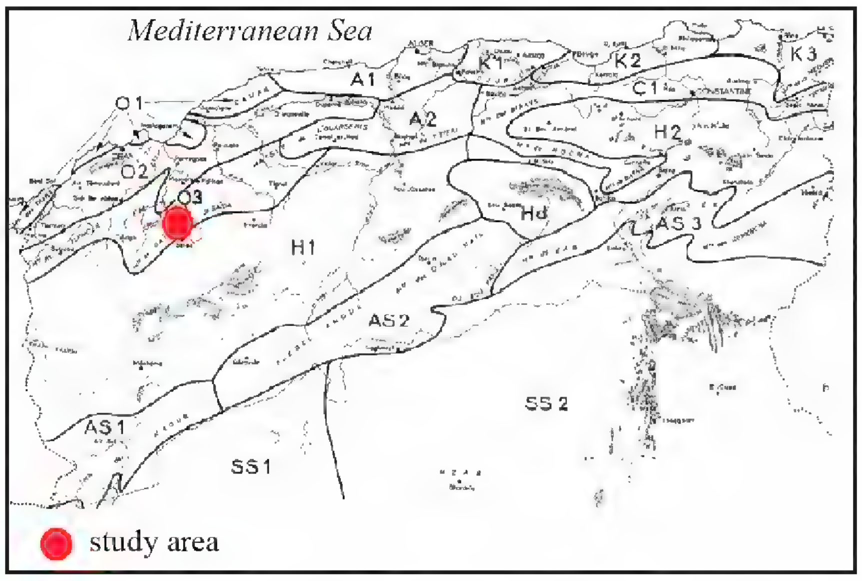

Figure 1. Location of the study area in the map of the main biogeographical territories of Algeria (Quézel & Santa, 1962–1963).

the comparison of data between our floristic inventory and the bibliographical data of taxa listed in the work on the Tell Atlas (Oran) (O3) of Quézel & Santa (1962–1963).

The type of sampling adopted in this work, called 'mixed', combines a stratified sampling to designate homogeneous ecological zones, followed by a sampling for the choice of stations inside of these areas during spring and autumn from 2017 to 2019 (some species are autumn-flowering, others early flowering and others late).

The determination of the main homo-ecological zones is carried out on the basis of integration of maps of different stratifiers such as altitude, slope, soil type, exposure, substrate, and vegetation physiognomy, in the Geographic Information System (G.I.S). Regarding topographic stratifiers, we have developed a digital field model (M.N.T) from a radar image by the software Mapinfo then extracted the cards altitudes, slopes, and exhibitions. For other stratifiers, we used the lithologice map (B.N.E.D.E.R, 1992), the geological units map of the study area (S.A.T.E.C, 1976) and the map of plant formations (B.N.E.D.E.A, 1992).

The cross of data was done by the following function:

$$\frac{1}{N} \times \sum (A_i + B_i + C_i + D_i + E_i + F_i)$$

N: number of parameters used in model = 6; A: pixel information in parameter a (substrates); B: pixel information of parameter b (type of soil); C: the pixel information of the parameter c (physionomy); D: the pixel information of the parameter D (altitude); E: pixel information for the parameter E (slope); F: the pixel information of the parameter F (exposure).

323 phytoecological surveys spread over the 7 zones covering our entire study area were carried out on ace surfs that were remarkably homogeneous. The minimum area retained is 100 m^2 containing almost all of the species present (Braun-Blanquet, 1932).

The botanical identification of taxa was made at Laboratory of Ecology and Management of the Natural Ecosystems, Aboubakr Belkaid University (Tlemcen) using the works of Quézel & Santa (1962-1963) to determine the regional range (biogeographic distribution) and Dobignard & Chatelain (2010–2013) to update the flora.

The Factor Analysis of Correspondences (F.A.C) allows us to search for the affinities that exist between species and/or surveys (taxa data, coded in the presence-absence) in order to determine ecological factors that influence the distribution of these 18 taxa at prospected stations. The hierarchical ascending classification (H.A.C) is used to determine plant groups. The analyses were performed using XLSTAT software.

RESULTS

Following the overlay of the various maps and field surveys, we have cleared seven ecological zones (Table 1).

The floristic inventory of the study area allowed us to list 344 taxa divided into 77 families and 223 genera of which we discovered 18 taxa not already observed in the biogeographic subsector O3 (Table 2, 3).

The distribution of the 18 taxa at the seven stations in the study area is heterogeneous according to environmental variables (including rugged terrain and a mixture of various plant species) (Fig. 2).

The abundance of these taxa is divided as follows: *Atractylis humilis* subsp. *caespitosa* has the largest abundance (339 specimens), *Quercus faginea* (113 specimens), *Artemisia herba alba* (93 specimens), *Carduncellus pinnatus* (73 specimens), *Centaurea acaulis* subsp. *boissieri* (61 specimens), *Clematis cirrhosa* (51 specimens), *Thymelaea virescens* (46 specimens), *Retama retam* (47 specimens), *Anacyclus valentinus* (32 specimens), *Crithmum maritimum* (30 specimens), *Echium confusum* (19 specimens), *Helianthemum pomeridianum* and *Salvia argentea* subsp. *patula* (14 specimens), *Ailanthus altissima* (11 specimens), *Scrofularia hypericifolia* (7 specimens), *Iris unguicularis* (6 specimens) and *Fraxinus augostifolia* and *Laurus nobilis* (4 specimens) (Fig. 3).

The dendrogram of hierarchical ascendant classification (HAC), applied to these taxa, shows that the 18 taxa are divided into three main groups (Fig. 4).

The group "A" is made up of *Artemisia herba alba, Atractylis humilis* subsp. *caespitosa*, *Centau-*

rea acaulis subsp. *boissieri*, *Helianthemum pomeridianum*, *Retama retam*, *Scrofularia hypericifolia*, *Thymelaea virescens*.

The group “B” is made up of *Clematis cirrhosa*, *Crithmum maritimum*, *Iris unguicularis*, *Anacyclus valentinus* and *Salvia argentea* subsp. *patula*.

The group “C” is made up of *Ailanthus altissima*, *Carduncellus pinnatus*, *Echium confusum*, *Fraxinus augostifolia*, *Laurus nobilis* and *Quercus faginea*.

The study of the distribution of species and points surveyed points (FAC) (Fig. 5) shows that axis 1, which expresses 33.51% of the total variance, opposes on both sides of the origin the contributing species linked to plant formations located in low altitudes (T13, T14 and T15) to those high-altitude plant formations. This axis seems to reflect an ecological gradient linked to altitude. This gradient would be associated with the amount of precipitation and temperature.

Axis 2, which accounts for 18.65% of variance, also contrasts species of plant formations located in a northern geographical position with those in a southern geographical position (T15). This axis seems to express an ecological gradient linked to the physionomic type of plant formations, from clear herbaceous and champhyte formations to degraded woody formations (R39). This gradient would be associated with the impact of anthropogenic pressure on natural forest formations, overgrazing, clearing and especially repeated fires.

DISCUSSION

It is clear from this work that the area of Doui Thebet is characterized by a remarkable floristic diversity. The specific richness is 344 plant species equal to 9.18% of Algeria’s flora (3744 taxa) (Do-

Zone	Ecological conditions				
	Biotope	**Elevation (m)**	**Position**	**Slope (%)**	**Soil**
1	Scrub: *Pinus halepensis* Miller	900-1203	Northwest to Northeast	0-6	red brown, sanded-textured soils
2	Riverine	580-600	Northwest to Northeast	0-3	light-textured red brown soils
3	Scrub: *Tetraclinis articulata* (Vahl) Masters	720-897	South	3-11	Limestone brown soil
4	Scrub: *Olea europaea* L. and *Pistacia lentiscus* L.	900-1150	Northeast	≥ 12	Lithosol
5	Scrub: *Tetraclinis articulata* (Vahl) Masters and *Juniperus oxycedrus* L.	900-1000	South	3-10	red-brown soils with humiferous
6	Scrub: *Cistus* L.	800-950	Northwest to Northeast	0-4	red brown, sanded-textured soils
7	Scrub: *Rosmarinus officinalis* L. and *Lavandula stoechas* L.	850-989	Flat	0-5	red brown, sanded-textured soils

Table 1. Characterization of stations sampled in the study area.

Family	Number of species	Family	Number of species
Aizoaceae	1	Linaceae	2
Alliaceae	1	Lythraceae	1
Anacardiaceae	4	Malvaceae	3
Araceae	1	Moraceae	1
Arecaceae	1	Myritaceae	1
Araliaceae	1	Neuradaceae	1
Asteraceae	60	Oleaceae	5
Asparagaceae	3	Orchidaceae	4
Asphodelaceae	1	Orobanchaceae	2
Aspleniaceae	2	Oxalidaceae	1
Apiaceae	16	Papaveraceae	3
Apocynaceae	1	Pinaceae	1
Boraginaceae	4	Plantaginaceae	4
Brassicaceae	20	Poaceae	13
Capparaceae	1	Polygalaceae	1
Caprifoliaceae	1	Polygonaceae	3
Caryophyllaceae	5	Primulaceae	3
Cistaceae	10	Pteridaceae	2
Colchicaceae	1	Rafflesiaceae	1
Convolvulaceae	3	Ranunculaceae	9
Cupressaceae	3	Resedaceae	2
Cucurbitaceae	1	Rhamnaceae	2
Crassulaceae	7	Rosaceae	4
Dipsacaceae	2	Rubiaceae	5
Ericaceae	2	Ruscaceae	1
Euphorbiaceae	2	Rutaceae	2
Fabaceae	42	Salicaceae	2
Fagaceae	3	Santalaceae	1
Frankeniaceae	1	Scrophulariaceae	3
Gentianaceae	2	Sinopteridaceae	1
Geraniaceae	4	Simaroubaceae	1
Globulariaceae	1	Smilacaceae	1
Hyacinthaceae	4	Solanaceae	2
Illecebraceae	1	Tamariaceae	1
Iridaceae	5	Thymelaeceae	3
Juncaceae	1	Urticaceae	2
Lauraceae	1	Valerianaceae	1
Lamiaceae	27	Zygophyllaceae	1
Liliaceae	2	/	/

Table 2. Number of species by family.

N°	Taxa	Biogeographic distribution (Quézel & Santa 1962-1963)	Station
1	*Ailanthus altissima* (Mill.) Swingle	Invasive	3
2	*Artemisia herba-alba* Asso	CCC: H1-2, SS1-2	1, 3, 6, 7
3	*Atractylis humilis* subsp. *caespitosa* (Desf.) Maire	CC: H1-2, AS1-2	1, 3, 6, 7
4	*Carduncellus pinnatus* (Desf.) DC	R: KI: Djurdjura, A2: 01-3, H1-2	6
5	*Centaurea acaulis* subsp. *boissieri* Maire	C1	1, 3, 6, 7
6	*Clematis cirrhosa* L.	C: Coastal area, R: Elsewhere	2, 4, 6
7	*Crithmum maritimum* L.	CC	2, 4, 6
8	*Echium confusum* Coincy	CC: Coastal area	2, 6
9	*Fraxinus angustifolia* Vahl	Invasive	1
10	*Helianthemum pomeridianum* Dunal	CCC: O1, Coastal area: Oran, O2: Coastal plains subsector	1, 3, 6
11	*Laurus nobilis* L.	AC: Tell Constantinois and Algerians	1
12	*Quercus faginea* Lam.	AC: in the forests of the Tell mountains east of Algiers	1
13	*Retama raetam* (Forssk.) Webb. & Berthel	C: Hd. AS1-2, H1-2. SS1-2, SO	1, 3, 6, 7
14	*Scrophularia hypericifolia* Sprengel	CC: SS1-2, Hd	1, 3, 6, 7
15	*Thymelaea virescens* Meisn.	Arid region	1, 3, 5, 7
16	*Iris unguicularis* Poir.	CC: Tell Constantinois and Algerians	4 et 6
17	*Anacyclus valentinus* L.	AC: H1, AS1, SS1-2.	1, 2, 4, 6
18	*Salvia argentea* subsp. *patula* = *Salvia patula* L.	C: H1-2	4, 6

Table 3. New species for the flora of the Tell Atlas (Oran) sub-sector (O3).

bignard & Chatelain, 2010–2013). These species belong to 223 genera and 77 families; of these, 8 families clearly dominate the flora of the area of Doui Thabet. These families, recognized by their acclimatization to the aridity of the climate of the area, are: Asteraceae (60 species equal to 17.44%), Fabaceae (42 species equal to 12.20 %), Lamiaceae (27 species equal to 7.84 %), Brassicaceae (20 species equal to 81 %), Apiaceae (16 species equal to 4.65 %), Poaceae (13 species equal to 3.77 %), Cistaceae (10 species equal to 2.90%) and Ranunculaceae (9 species equal to 61%). They alone total 197 species, or 57.26% of the total; the other 69 families contribute to the 42.74% of the total.

This result is different from that obtained by Djebbouri & Terras (2019) in a work on floristic diversity with particular reference to endemic, rare, or endangered flora in forest formations of Saida (Algeria). They did not find 16 families and 27 non-common families or 35 species: Alliaceae (1 taxon), Araceae (1 taxon), Araliaceae (1 taxa), Asphodelaceae (1 taxon), Capparaceae (1 taxon), Colchicaceae (1 taxon), Dipsacaceae (2 taxa), Frankeniaceae (1 taxon), Gentianaceae (2 taxa), Globulariaceae (1 taxon), Hyacinthaceae (4 taxa), Illecebraceae (1 taxon), Juncaceae (1 taxon), Lauraceae (1 taxon), Lythraceae (1 taxon), Neuradaceae (1 taxon), Rafflesiaceae (1 taxon), Rhamnaceae (2 taxa), Ruscaceae (1 taxon), Salicaceae (2 taxa), Santalaceae (1 taxon), Sinopteridaceae (1 taxon), Simaroubaceae (1 taxon), Solanaceae (2 taxa), Tamariaceae (1 taxon), Valerianaceae (1 taxon) et Zygophyllaceae (1 taxon).

This difference in results can be explained by: research limited, the duration of the surveys, the sampling techniques used.

The hierarchical classification shows that there

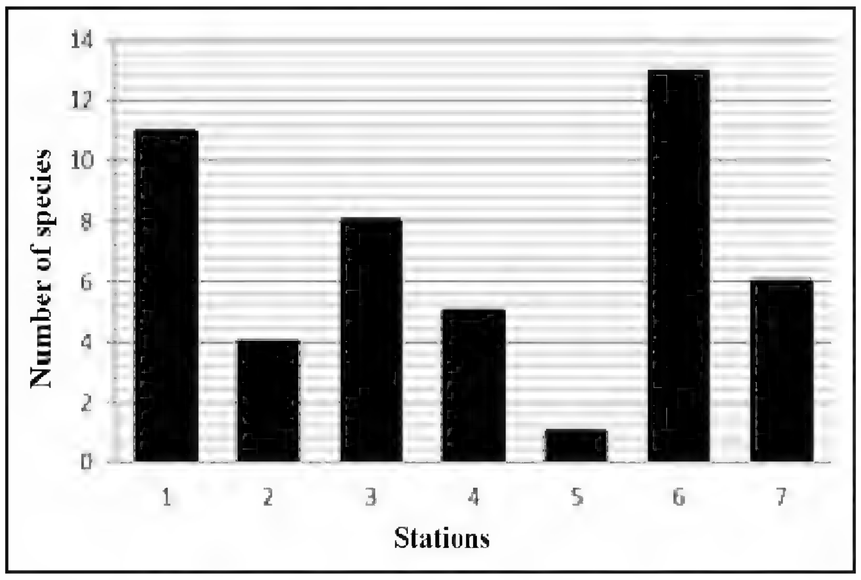

Figure 2. Number of species recorded in each area.

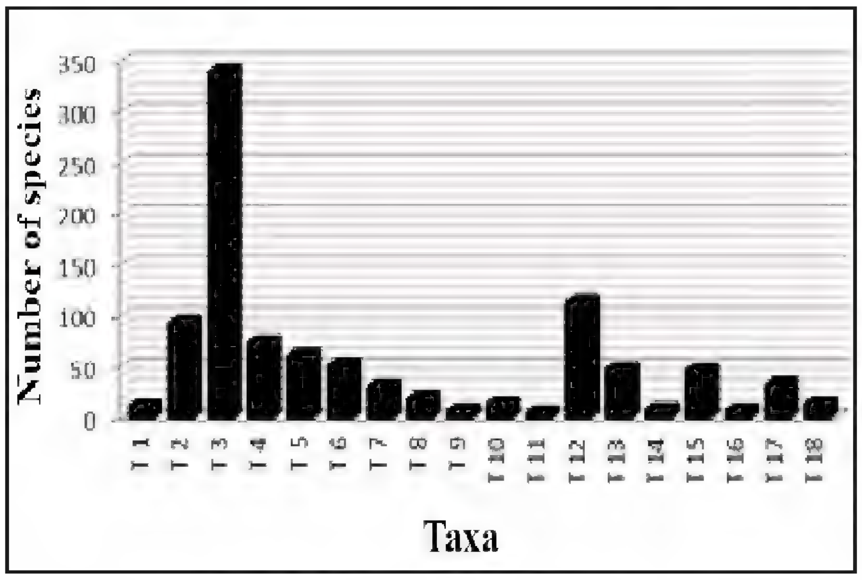

Figure 3. Abundance of each taxon.

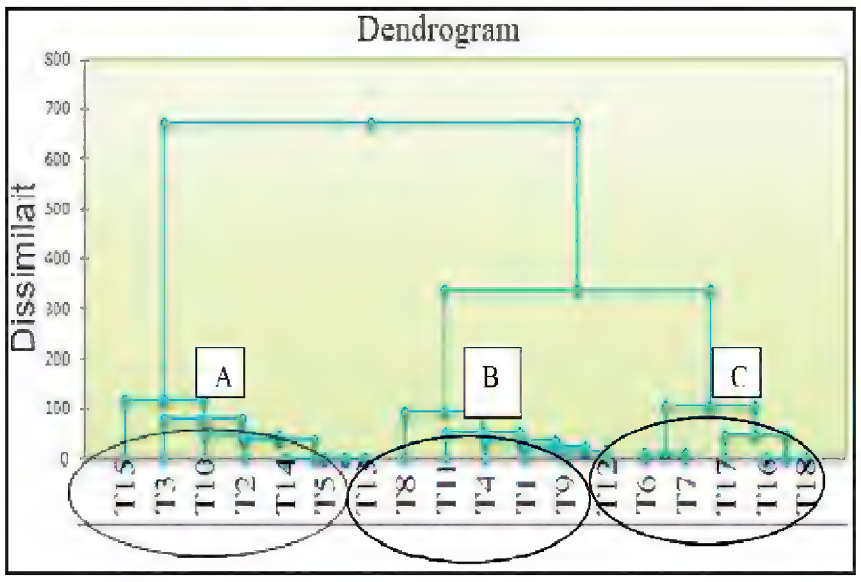

Figure 4. Ordination of hierarchical ascendant classification (HAC).

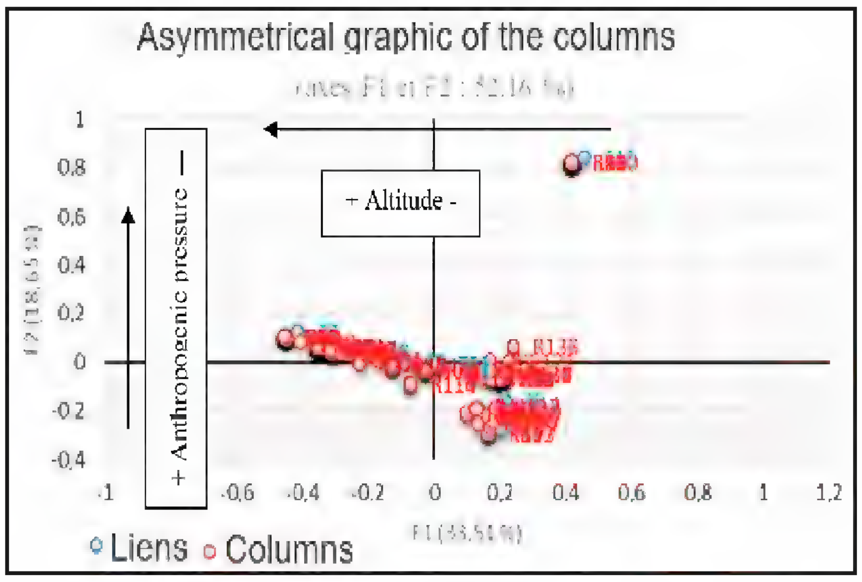

Figure 5. Ordination of the Factor Analysis of Correspondences (FAC).

are three groups divided as follows: the first concerns xerophilic species from the arid and hyperarid regions of the sectors and subsectors (H, SO, SS1-2, AS1-2-3 and SC), the second areas of well-watered areas and the coastline of two sub-sectors (O1: Coastal Sahel subsector and O2: Coastal Plains Subsector), the third relates to invasive species disturbance of the environment (see Quézel & Santa, 1962–1963) and the eastern region which is characterized by a humid and subhumid climate thanks to the high altitudes of Tell Atlas.

The appearance of *Thymelaea virescens*, *Artemisia herba-alba*, *Atractylis humilis* subsp. *caespitos*, *Retama retam*, *Carduncellus pinnatus*, *Scrofularia hypericifolia*, *Salvia argentea* subsp. *patula* and *Anacyclus valentinus* at the level of our study area is justified by the refuge of these species of origin from the area sigh plateaus (H), Saharan Atlas (AS), Sahara Central (SC), Hodna Subsector (Hd), Western Subsector of The Northern Sahara (SS1), Eastern Subsector of the Northern Sahara (SS2) and Western Sahara Sector (SO), which is characterized by an arid and hyperarid climate to the north (our semi-arid climate study area) as a mechanism for adapting to climate change. A similar result was observed by Babali et al. (2014) in the Moutas-Tlemcen Game Reserve which shows the refuge of 9 exogenous plant species from the (O3) to the north : *Anacyclus valentinus* : (H1, AS1, SS. A: SC), *Centaurea acaulis* subsp. *balansae* (R and R.) M: (Constantinois), *Atractylis humilis* subsp. *caespitosa* (Desf.) M. (H, AS), *Diplotaxis harra*: (H1-2, AS1-2-3, SS: Up to mouydir), *Ophrys subfusca*: (K3, C1, K1, Al-2, O: Mostaganem), *Pituranthos scoparius*: (H1-2, AS1-2-3, SS, SC, SO), *Ranunculus gramineus*: (H1-2. AS1-2-3), *Salvia argentea* subsp. *patula*: (H1-2: Mountains), *Thymelaea argentata = T. nitida Desf.*: (H1-2) to the North.

These results are consistent with these of Maire (1952), Singh & Wheaton (1991), Brooks et al. (1998), Hebda (1998), Thompson et al., (1998), Hansen & Dale (2001), Li et al. (2000), Kirschbaum (2000), Malcolm et al. (2002), Chuine et al. (2004), Callaghan et al. (2005), Gray (2005), Juday et al. (2005), Usher et al. (2005), Hamman & Wang (2006), Mckenney et al. (2007) and Aitken et al. (2008).

The presence of all these species in our study area is explained by the existence of local microclimates at high altitudes (1203 meters) and on the northern slopes of the mountains which receives a significant amount of moisture from the Mediterranean Sea.

Regarding the two invasive species, their presence indicates two things: 1) this area is in a state of disturbance due to human actions and especially the repeated fires at Station 1 (El Ache) and 3 (Oum Touadjine) during the period of 1992-2015, this result is consistent with the mention of Quézel & Santa (1962–1963): “Ailanthus altissima *(Mill.) develops in disturbed areas*”; 2) climate change is expected to affect the introduction of exotic species (Usher et al., 2005).

Regarding *Quercus faginea*, 113 natural relics were found; the average height of these specimens varied between 15–18 meters. Usually, they are found in high cliffs and, in some cases, also in the wadis. A study on the ancient flora is necessary because Quézel & Santa (1962–1963) did not mention the presence of this species and *Laurus nobilis* in this area.

CONCLUSIONS

Due to its geographical location, the vascular flora of the Thabet area is rich and diverse with 344 taxa, which reinforces the interest for the protection and conservation of this floristic diversity.

This work highlights the change in the distribution of flora at the regional level by the appearance and emergence of new plant species (8 species) in this subsector O3 observed in the phytogeographic areas of the climate arid and hyperarid and by the introduction of two exotic species indicator of ecosystem disturbance. The other species are the result of microclimates linked to the elevation, to streams presence and the northern position of the mountains that receive a significant amount of moisture Mediterranean Sea.

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Role of *Aphytis lepidosaphes* Compere, 1955 (Hymenoptera Aphelinidae) in limiting *Lepidosaphes beckii* (Newman, 1869) (Homoptera Diaspididae) populations in an orange orchard in Rouiba (Algeria)

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ABSTRACT This work highlights the study of *Lepidosaphes beckii* (Newman, 1869) (Homoptera Diaspididae) population dynamics as well as the impact of its external parasite *Aphytis lepidosaphes* Compere, 1955 (Hymenoptera Aphelinidae) in an orange orchard in Rouiba (Algeria). A year period study shows that *L. beckii* has three generations per year: the first is the autumnal generation; the second is through the spring and the third throughout summer. Moreover, this cochineal presents a very strong affinity for the central part of the trees and the lower side of the tree leaves which offers optimal conditions for its development. *Aphytis lepidosaphes* also develops three generations per year: in autumn, spring and summer, matching perfectly the three generations of its host. The parasite can be found where its host is abundant (plentiful). The global parasitism rate records is 22.54% for *L. beckii*, this rate remains weak to control the cochineal populations.

KEY WORDS *Aphytis lepidosaphes*; *Citrus*; *Lepidosaphes beckii*; Parasitic incidence; Parasitoid.

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INTRODUCTION

The Insecta belongs to the Coccoidea superfamily, which is divided into 23 families and 7700 species (Sforza, 2008) distributed throughout the world and more particularly in the southern hemisphere. These species are not all crop pests. Some are used in the daily life of humans and considered useful insects (Kreiter et al., 1998). However, three families cause major economic damage in the world: Coccidae, formerly known as lecanines, Pseudococcidae or mealybugs and Diaspididae or shielded mealybugs or diaspines. *Lepidosaphes beckii* (Newman, 1869) (Homoptera Diaspididae) constitute the most important pest of citrus fruits in Algeria. This insect is also considered a major pest of citrus in South Africa and Spain (Ben-Dov et al., 2014).

Indeed, biological control has very quickly been an effective way to fight mealybugs. It is one of the most effective given the sedentary nature of these pests (Foldi, 2003). In many geographical areas, the ectoparasitoid *Aphytis lepidosaphes* Compere, 1955 (Hymenoptera Aphelinidae) is reported as the most effective, natural enemy of *L. beckii*. In Florida, the parasitoid effectively controls cochineal populations at a parasitism rate of 50% (Stathas et al., 2015). The number of females in the parasite usually exceeds that of males (Waterhouse & Sands, 2001).

The study of this parasite allows us to have the opportunity to fight against this pest in order to improve yields and ensure a place among citrus producing countries.

MATERIAL AND METHODS

The study is conducted on a private farm in the Rouiba region (36°44'00" N and 3°17'00" E). This region is located East of Mitidja 25 km from Algiers and 7 km from the Mediterranean Sea. This experiment started at the beginning of November 2014 and ended in August 2015.

The study orchard has an area of 1.5 ha consisting of 425 orange trees of Washingtonia variety navel planted in 1990. The procedure requires regular sampling over time. The method used is inspired by the work of Vasseur & Schvester (1957). It consists of choosing 2 trees from which are taken 1 branch of 20 cm long and 2 leaves from each cardinal direction (North, South, East and West) and in the center of the tree. Then, these samples are placed differently in kraft paper bags on which all coordinates are mentioned (date, direction, etc.).

The twigs and leaves harvested are carefully examined under a binocular loupe. The different biological states of the mealybug are quantified and recorded on cards bearing the date of the release and the direction of sampling. For each stage we quantify the total number of live, dead and parasitized *L. beckii* individuals in order to assess the state of infestations and the evolution of its parasite *A. lepidosaphes* over time.

RESULTS AND DISCUSSION

Overall evolution

An overall examination of the fluctuations of the mealybug populations reveals the presence of three periods of intense activity: an autumnal period, a spring season and a summer season. The most important peaks are recorded during the spring and summer period. However, there are three very distinct peaks: the first peak at the beginning of January (10.02%), the second during the month of March (20.53%) and the last during the month of June (27.97 %) (Fig. 1).

The results obtained on the population dynamics of *L. beckii* during the period from 1 November 2014 to 10 August 2015 confirm the existence of three annual generations: an autumn generation, a spring generation and a summer generation. Zuniga (1971) reported three annual generations in northern Chile, two to three generations per year in the central region and only one annual generation in the southern region. On the other hand, in the Eastern Cape in South Africa, De Villiers (1998) reports four generations annually and Smirnoff (1960) found four generations a year in Morocco. The majority of authors agree to count from 2 to 5 generations, this figure varies according to the region's climate conditions chosen for the study and the smallest number of generation is observed in the countries where the rigor of the winter imposes a stoppage of development (Benassy, 1975).

Cardinal distribution

The results of figure 2 shows that the center orientation is most favored by this scale with a percentage of 35.99%. This place seems to be a preferential place for this cochineal. Indeed, according to Fabres (1979), the influence of the thermo-hygrometric conditions of the shaded habitat on the rate of expansion of the cochineal are very favorable to the cochineal. The East of the tree comes in second place hosting 24.25% of the global population of the cochineal.

The spatial distribution of this species on the tree is closely related to the microclimate created within the tree. Moreover, the species have a marked preference for the center orientation of the tree. This place seems to give it favorable conditions for its optimal development. Moreover, this species shows in a remarkable way the lower face of the leaf.

Distribution according to the plant organ

The results reported in figure 3 show that the cochineal prefers to attach to the leaves and precisely on the underside with 46.32% against 41.17% on the upper face. This place offers cochineal favorable fixation conditions. Indeed, the blade of the leaf is of a very fine texture favoring the bites of opophagous insects. Avidov & Harpaz (1969) noted that this cochineal prefers trees with thick foliage and settles more on leaves and fruits than on young branches. According to Fabres (1979), for the *L. beckii* scale, the leaves are the organs of choice.

Ecology of Aphytis lepidosaphes

We counted 99 eggs of the parasite throughout our study period. At the beginning of our sampling, eggs accounted for 30.16% of the global parasite population during the month of November. From this date, there is a gradual regression of eggs to disappear almost entirely during the winter period. As soon as atmospheric conditions become favorable again, we can see a recovery of the egg-laying, as it already is 3.85% as of February. Subsequently, the number of eggs gradually increases to 22.22% during the month of May and then decreases during the month of June. The oviposition of the parasite is once again taking place in August with 23.91% (Fig. 4). In general, it is very rare to observe the eggs of *A. lepidosaphes*. Benassy (1961) reports that all *Aphytis* Howard, 1900 pierce the host's shield to deposit their eggs. This limitation is probably due to the difficulty of piercing the shield of some mealybugs.

The larvae of *A. lepidosaphes* are represented by young larvae and older larvae. Concerning the fluctuations of the young larvae, we note the presence of three peaks of populations: the first peak in November (44.44%), the second in April (15.07%) and the third in August (26.09%) (Fig. 5). For older larvae, their rate varies between 88.46% and 100% during the month of December to February. Note that this stage represents the wintering stage of the parasitoid. From the beginning of April, there is a new increase of these larvae in the cochineal populations, and they reach their maximum in June with 48.24%. From this date, their number will decrease more and more to reach their lowest rate during the month of August with 2.17% (Fig. 6).

At the beginning of our sampling, nymphs are rarely present in cochineal populations. Indeed, they display only 7.94% during the month of November to disappear then completely the whole winter period. It is only from the month of February that they appear in the populations of its host where they display at this date 7.69% of the global population of the parasitoid. The highest rate is noted during the month of March with 44.11%. There is then a gradual decrease in numbers of these larvae to reach their lowest level during the month of June. A new evolution is then noticed and a new peak is noted during the month of August with 45.65% (Fig. 7).

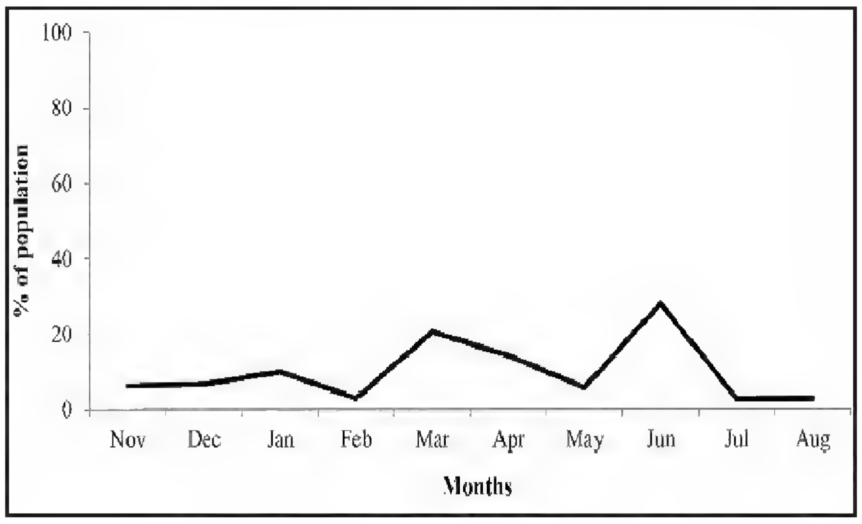

Figure 1. The Overall Fluctuation of *L. beckii* populations on orange trees in the Rouiba region.

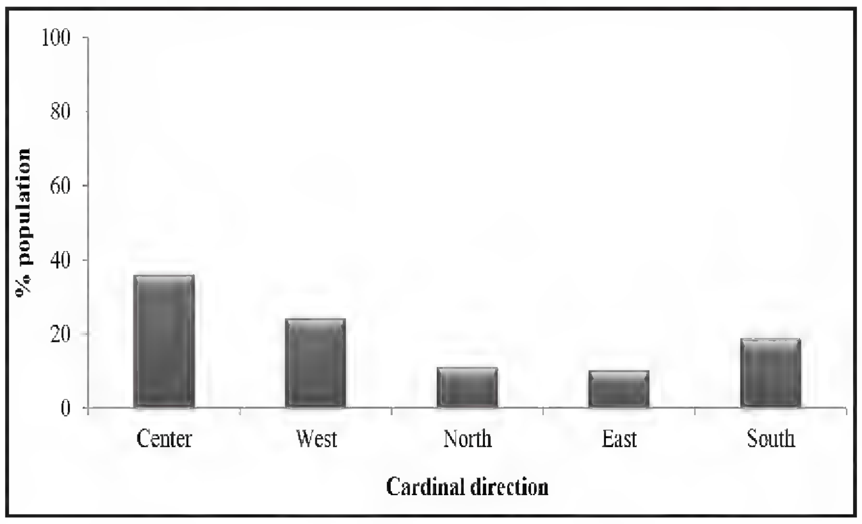

Figure 2. The global Cardinal distribution of *L. beckii* on orange trees in Rouiba region.

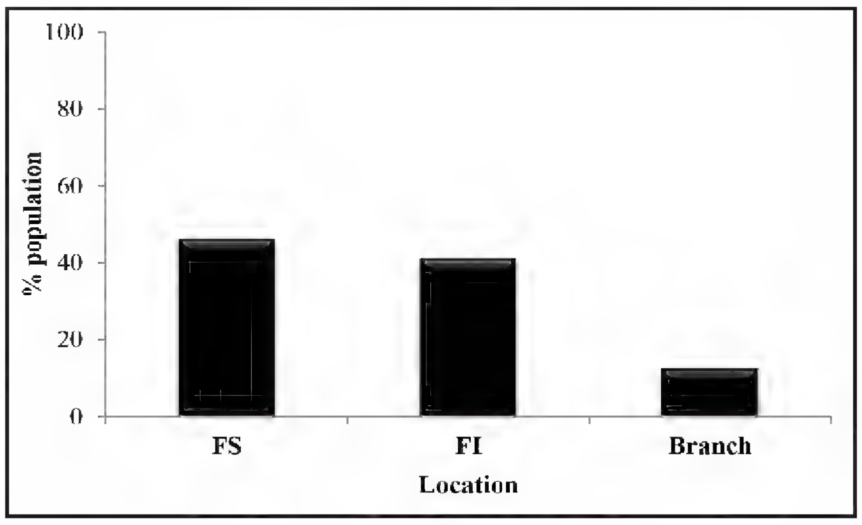

Figure 3. Distribution of the global population of *L. beckii* on orange trees in Rouiba.

Once mature, these adults perforate the mealybug shield and search for their hosts to lay their eggs. It is interesting to note that during our observations we counted up to three parasite individuals on the same host, so this parasite is considered a gregarious ectoparasite. When counting, we did not observe adult *A. lepidosaphes*. The highest percentages are noted during the spring period. Indeed, we note a percentage of 17.54% during the month of March. There is a significant presence thereafter from April to August (Fig. 8).

Parasitic incidence

The overall parasitism rate in *L. beckii* fluctuates throughout the study period and is around 22.54%. However, this parasitism rate remains very low to control populations of *A. lepidosaphes*. The parasitism rate fluctuations recorded in the insect scale population first pass through a first peak during the month of March with a rate of 33.39% and the second peak in June with a parasitism rate of 28.58% (Fig. 9). Two-way analysis of variance showed that time (months) and orientation had a very highly significant effect on population dynamics and parasite incidence of *L. beckii* (P = 0.0001 <0.001) with 80.2% of variations in dynamics and 92.6% of variations in parasite incidence. Also, two-way analysis of variance showed that time (month) and organ have a very highly significant effect on population dynamics and parasite incidence of *L. beckii* (P = 0.0001 < 0.001) with 82.4% of changes in dynamics and 98.4% of variations in parasite incidence. As for the parasite incidence, the results show that the rate of parasitism in *L. beckii* has improved compared to last year (22.54%). *Aphytis lepidosaphes* and *Encarsia* sp. (Hymenoptera Aphelinidae) have together parasitized up to 32% of *L. beckii* (Stathas et al., 2015). The parasite is located much more where the cochineal is in large numbers.

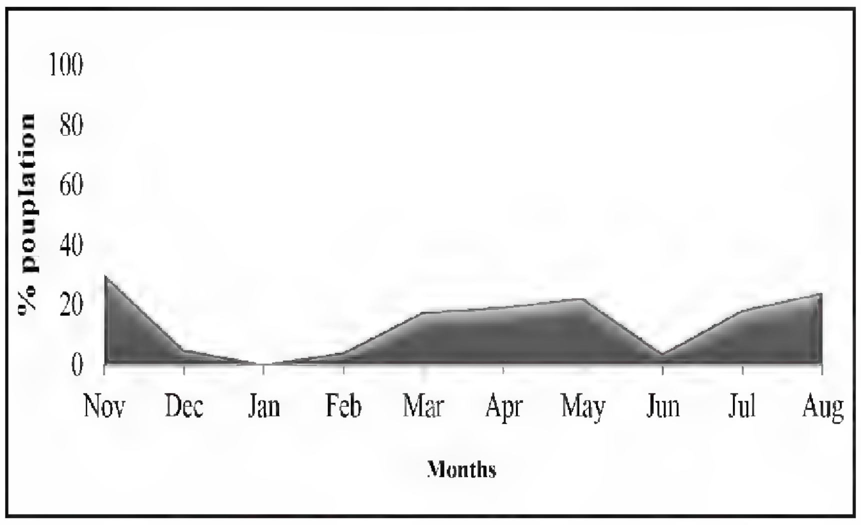

Figure 4. Fluctuation of eggs of *A. lepidosaphes* on *L. beckii* populations on orange trees in Rouiba.

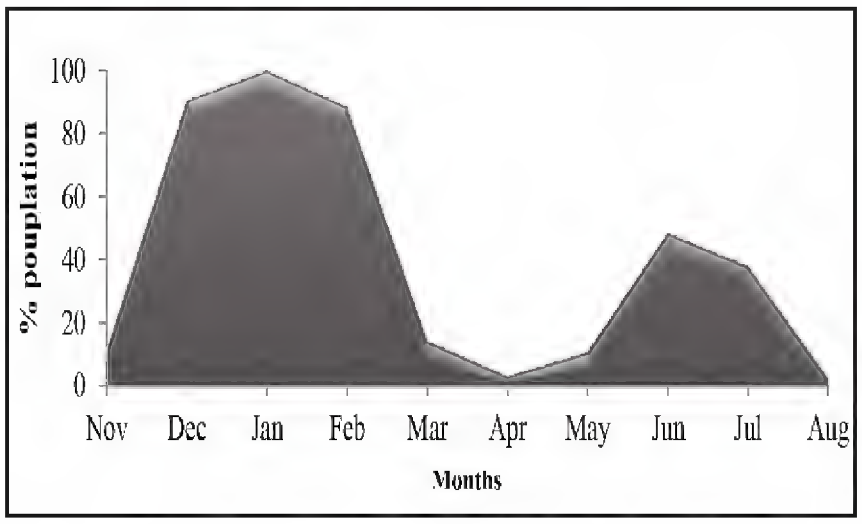

Figure 6. Fluctuation of older larvaes of *A. lepidosaphes* in the populations of *L. beckii* on orange trees in Rouiba.

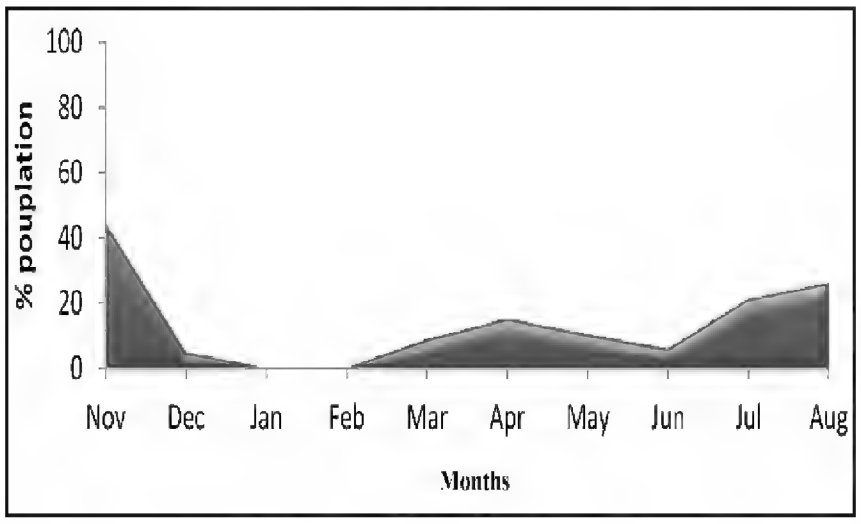

Figure 5. Fluctuation of young larvae of *A. lepidosaphes* in the populations of *L. beckii* on orange trees in Rouiba.

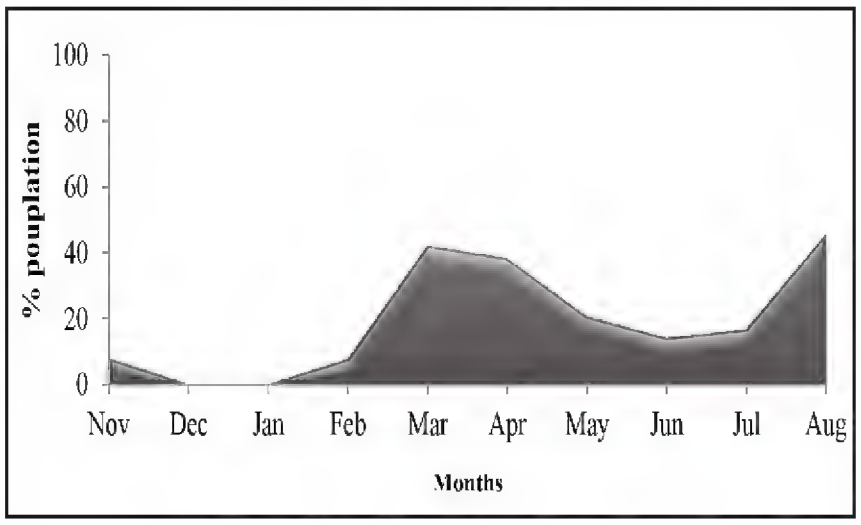

Figure 7. Fluctuation of nymphs of *A. lepidosaphes* in the populations of *L. beckii* on orange trees in Rouiba.

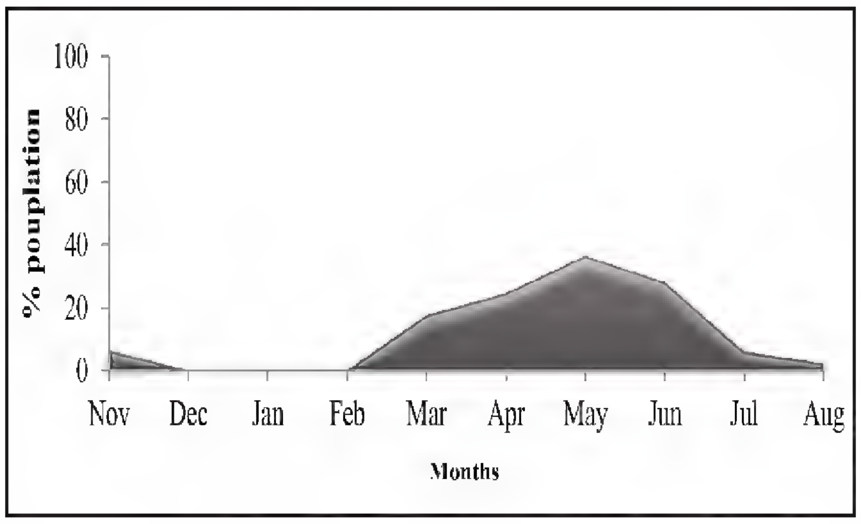

Figure 8. Fluctuation of adults of *A. lepidosaphes* in the populations of *L. beckii* on orange trees in Rouiba.

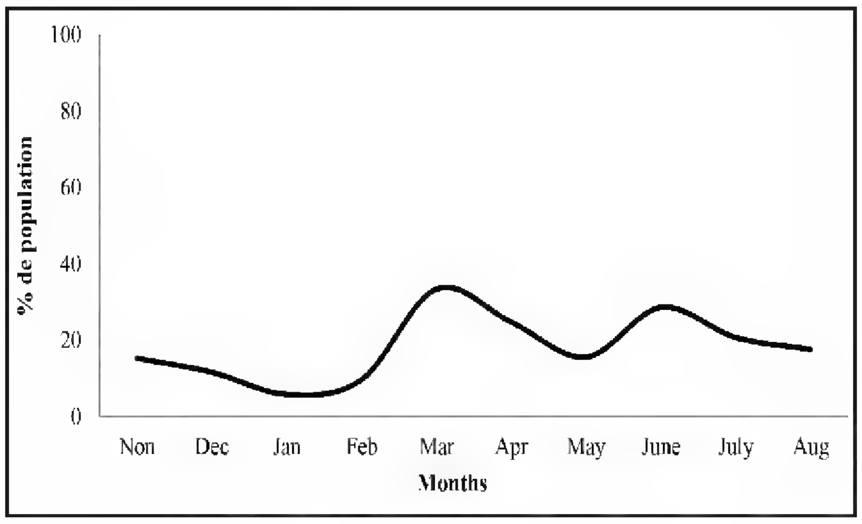

Figure 9. Impact of the global parasitism of *A. lepidosaphes* on the populations of *L. beckii* on orange trees in Rouiba.

The chemical treatments carried out in the orchard certainly contributed to limit the action of these parasites on the populations of the cochineal. Biological control methods should not be considered in isolation, but they have a chance of success in IPM strategies.

CONCLUSIONS

The results of fluctuations of *A. lepidosaphes* show that this parasitoid overwinters in the form of older larvae in the populations of its host where it develops 3 annual generations: an autumn generation, a spring generation and a summer generation. According to Fabres (1979), in New Caledonia, this parasitoid can develop two or three generations on a generation of its host which presents a great advantage in the use of this parasite in biological control. *Aphytis lepidosaphes* shows a preference for female stages although males are also attacked but with a low impact compared to that of females. According to Belguendouz (2014) the parasite is active on all organs and has a marked preference for young females.

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First record of *Zamenis lineatus* (Camerano, 1891) (Serpentes Colubridae) in Ischia Island (Italy)

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ABSTRACT With this work, we report for the first time the presence of the Italian Aesculapian snake *Zamenis lineatus* (Camerano, 1891) in Ischia island (Italy). Up to date, in this Mediterranean island, among ophidic species the presence of only *Hierophis carbonarius* (Bonaparte, 1833) has been reported; although, recently, the invasive species *Indotyphlops braminus* (Daudin, 1803) has been also detected. Further studies will be necessary to clarify whether the presence of *Zamenis lineatus* in Ischia island is autochthonous or whether is just an accidental observation due to a passive transport from the nearby coast of the Gulf of Naples.

KEY WORDS *Zamenis lineatus*; Italian Aesculapian snake; Ischia.

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INTRODUCTION

Reptiles and amphibians in Campania (Italy) have been widely reported in the regional Atlas of amphibians and reptiles (Guarino et al., 2012). Subsequently, Raimondi et al. (2014) published a paper about the new distribution data of the Campania herpetofauna, expanding the results recorded in the aforementioned atlas (Guarino et al., 2012). Specifically, to date, regarding the Campania islands, only two manuscripts have been published (Nappi et al., 2007; Cipolla & Nappi., 2008). A very complete and comprehensive study about the herpetofauna of the Italian islands is reported in the National Atlas of Italy (Corti et al., 2006). In any case, in none of these publications the presence of the Italian Aesculapian snake *Zamenis lineatus* (Camerano, 1891) has been reported in Ischia Island, indicating for this island, the sole presence of *Hierophis carbonarius* (Bonaparte, 1833) (Mezzasalma et al., 2015).

MATERIALS AND METHODS

Ischia is a volcanic and mountainous island in the Tyrrhenian Sea that lies at the northern end of the Gulf of Naples, about 30 kilometers from the city of Naples (Paolino et al., 2019). On 7th December 2019, one of the authors (R.S.) found a carcass of a specimen of *Zamenis lineatus*, victim of road traffic (Figs. 1, 2). The site where the observation was made is close to the "Bosco di Zaro", in the north-western side of the Ischia island, on the border between the municipalities of Forio and Lacco Ameno (40°45.4340'N - 13°52.5040'E), at an altitude of 87.9 meters above sea level. The site of the current observation is mainly characterized by lava soil and holm oaks (*Quercus ilex*). The total length of the snake was of 45 cm; the coloration of the livery and of the iris, as well as the the pattern of the blotches of the head were indicative of the classic phenotype (Salvi et al., 2017).

RESULTS AND DISCUSSION

Systematics

Classis REPTILIA Laurenti, 1768
Ordo SQUAMATA Oppel, 1811
Subordo SERPENTES Linnaeus, 1758
Familia COLUBRIDAE Oppel, 1811
Genus *Zamenis* Wagler, 1830

Zamenis lineatus (Camerano, 1891)

According to the geomorphology, the Campania Region presents all the possible Apennine and Mediterranean biotopes (Raimondi et al., 2014) and this aspect allows for a considerable biodiversity. Besides, the high humidity and temperature stability create an ideal habitat for the survival and reproduction of the herpetological species, and at the same time, justifying also the presence of invasive species, as *Indotyphlops braminus* (Daudin, 1803) has been recently detected in this little island (Paolino et al., 2019).

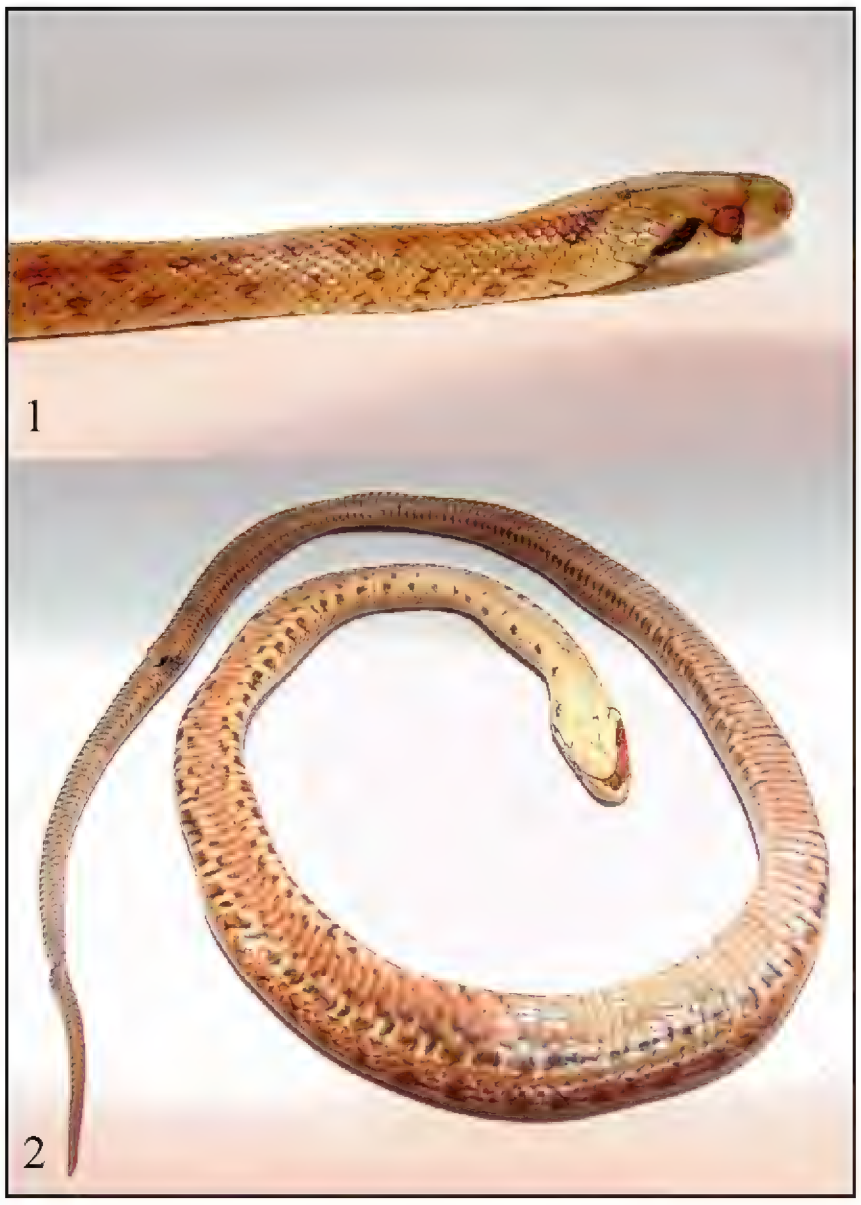

Figure 1. Particular of the specimen found in Ischia (Italy); the eyes are characterized by a round pupil, with the typical orange-reddish color of the iris. Figure 2. Ventral part of the same specimen, which shows a lighter color at the level of the head, becoming uniformly darker, greyish and marbled at the level of the trunk and tail.

The Italian Aesculapian snake *Zamenis lineatus* is an endemic snake of the southern Italy, including Sicily; however, its precise distribution in the different Italian regions is not precisely known (Razzetti & Zanghellini, 2006; Venchi & Luiselli, 2011). Up to date, the northern limit of this species is constituted by Morolo in the province of Frosinone (Corsetti & Romano, 2008). In Campania, this species has been also reported in the metropolitan area of Naples (Raimondi et al., 2014) and, if the hypothesis of a passive transport for anthropic reasons will be confirmed, from this area could come the specimen that we found in Ischia. However, it cannot be excluded that this specimen may be part of a stable population on the island, which moreover could fall within the natural distribution area of this species, as also reported in the distribution maps of the recent guide of Amphibians and Reptiles of Italy (Di Nicola et al., 2019).

ACKNOWLEDGEMENTS

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Physiological Indices and Nutritive Values of the Sea Urchin *Paracentrotus lividus* (Lamarck, 1816) (Echinodermata Echinoidea) of the Algerian West Coast

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ABSTRACT Seasonal variation in the physiological indices and biochemical composition of the sea urchin *Paracentrotus lividus* (Lamarck, 1816) (Echinodermata Echinoidea) from the west coast of Algeria were studied between March 2016 and February 2017 from three stations of different nature and geographical position: Sidi Lakhdar (S1), Cap Carbon (S2), and Benisaf harbor (S3). Two spawning period occurred in spring and autumn, resulting in a fall in gonad indices to a low level with values between 2.14 and 3.65%. The seawater temperature in the three sampling stations revealed that the latter had a spawning rate at 9–15 °C in spring and 24 and 11 °C in autumn corresponding to the two peaks of spawning. The biochemical composition of the gonads protein contents, carbohydrates and lipids were recorded with a high percentage for proteins between (25.80 and 45.23%) followed by that of lipids (9.21 and 14.40%) and finally carbohydrates (3.49 and 7.39%). In accordance with the gonad cycle, sea urchin lipids and proteins show a marked seasonal variation with a decrease in their percentages during the spawning period. Protein levels had an inverse profile with carbohydrates, with their values at a minimum when carbohydrates were at their maximum. The profile of the total components in the gut content is almost the same as in the gonads with minus values. A relationship has been found between the biochemical components of the gonads and the digestive tract during gametogenesis, the latter seems to be an organ that tends to store nutrients, indicating that populations of sea urchin *P. lividus* are in good nutritional conditions.

KEY WORDS Mediterranean Sea; Biochemical composition; Physiological indices; Sea urchin.

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INTRODUCTION

The reproductive cycle of the sea urchin *Paracentrotus lividus* (Lamarck, 1816) (Echinodermata Echinoidea) has been extensively studied in Ireland (Byrne, 1990), in Brittany (Allain, 1972; Spirlet et al., 1998), in the Canary Islands (Girard et al., 2006), in Morocco (Bayed et al., 2005), in Algeria (Dermeche et al., 2009; Dermeche et al., 2012; Boukhelf 2012; Belkhedim, 2010, 2015; Belkhedim, 2010, 2015 et al., 2014), and across the Mediterranean Sea (Fenaux, 1968; Lozano et al., 1995; Guettaf, 1997; Sánchez-España et al., 2004).

Several studies have been carried out on biochemical composition of sea urchin gonads in different parts of the world in order to evaluate and improve the important nutrients for these species (Keats et al., 1984; Fernandez, 1998; Montero-Torreiro & Garcia Martinez, 2003, Epherra, 2010; Arafa, 2012).

Studies on the biochemical composition and nutritional value in Algeria are non-existent despite the global economic importance of this echinid due to its gonads as seafood, hence the interest of the study by the strategy of the reproduction of *P. lividus* through the monitoring of gonad index and repletion index (GI, RI) in relation to the variations in the biochemical composition of the gonads and gut of sea urchins in different substrate media and floristic components to detect possible adaptations or changes in the behavior of this species as a result of changes in environmental conditions that may significantly affect the physiology of the sea urchin.

MATERIAL AND METHODS

Study area

The study area extends along the west coast of Algeria (Figure 1). Three sampling stations were selected by contribution to their characteristics: the first site, Sidi Lakhdar (S1), being under the influence of the watershed of wadi seddaoua North East of Mostaganem wilaya (36°12’40,63”N - 0°23’ 20,78”E), a zone characterized by a soft substrate and rich in photophilic algae and by the presence of the sparse beds of the *Posidonia oceanica* phanerogam, (Dermeche et al., 2010; Boukhelf, 2012); the second site, Cap Carbon (S2), located at the Arzew golf (35°54’05.71”N - 0°20’20.98”W), characterized by a rocky habitat rich in macrophyte (Kouadri, 2014; Boudjella, 2015); the third site, Benisaf harbor (S3), (35°18’16.8”N - 1°23’37.9”W) is characterized by a rocky substrate rich in photophilic algae and also by the presence of organic matter (Benguedda-rahal, 2011–12).

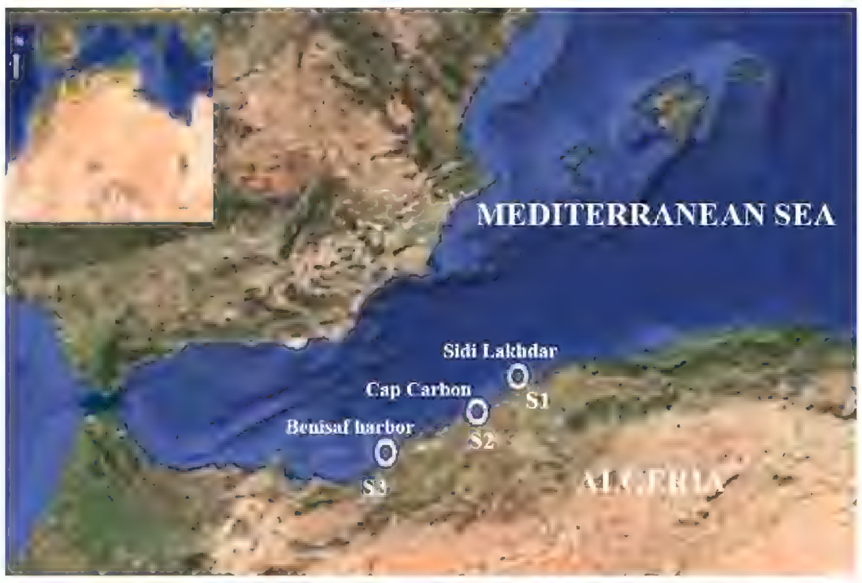

Figure 1. Geographical location of the sampling stations on the western coast of Algeria: Sidi Lakhdar (S1), Cap Carbon (S2), and Benisaf harbor (S3).

Samples collection

The study was conducted from March 2016 to February 2017. Sea urchins (≈20 specimens) per station with a diameter ranging between 45 and 60 mm were monthly collected from the intertidal zone at 0.5 meters up to 2 meters deep. The temperature was measured on the surface of the sea. Each sea urchin is opened by cutting the oral cap, the gonads and the gut were previously extracted, drained and weighed for the study of physiological indices, then frozen at -80 °C for a biochemical analysis.

Physiological indices. The individual total wet weight (TWW) was measured before dissection, gonad weight (GW) and gut content weight (GCW) were measured for each organism to the nearest 0.01 g for physiological index determination.

Repletion index (RI) and gonad index (GI) were calculated for each individual using the following equations: $RI = (GCW/TWW) \times 100$ and $GI = (GW/TWW) \times 100$ (Fenaux et al.,1977; Carboni et al., 2015).

Biochemical analysis. For proteins, the method of Lowry et al. (1951) was applied after extraction in phosphate buffer using bovine serum albumin (BSA) as the standard. For carbohydrate, the sample was assayed according to the method of Dubois et al. (1956) using glucose as a standard. Total lipids were extracted and quantified according to the method of (Folch et al., 1957).

Statistical analyzes

Results are presented as the means ± standard deviations (mean ± SD). Homogeneity of the data was explored with the Levene test, a post hoc multiple comparison analysis of Duncan was chosen to determine the differences between the independent factors.

For better interpretation, the data were analyzed by Pearson correlation. All statistical analyses were performed with the use of the software package Statistica 6.0 and SPSS 20.

RESULTS

The average monthly gonad index (GI) and repletion index (RI) as a function of seawater temperature are shown in figure 2.

Evolution monitoring of the physiological index at the three stations shows a significant average monthly variation (Anova F = 3.41) $p < 0.001$. The highest values of the RI in order of 18.88 ± 2.14% (May) is registered at site 1 and 15.87 ± 2.84% (May) at site 2 and 16.52 ± 1.49% (April), at site 3, against minimum values used for all individuals recorded one month before spawning in order of 7.28 ± 3.51% (September), 6.64 ± 2.21% (March), and 7.25 ± 1.84% (February) for the three sites respectively. In terms of gonadal index, average percentages were significantly affected by season (Anova F = 3.90) $p < 0.05$, the highest values being observed in September at the S1 with 11.67 ± 1.42% and in January at both site 2 and site 3 with values of 9.31 ± 1.74% and 9.47 ± 0.68% respectively. While the lowest values translate into a sharp drop in the percentage of GI, being from 2.14 ± 1.33% (March) and 3.18 ± 1.29% (November) at site 1, (3.4 ± 0.68%) in April and (2.26 ± 0.76%) in September at site 2 , and for populations at site 3, values are recorded at April (2.19 ± 1.22%) and October (3.65 ± 1.31%).

The monthly sampling of the seawater temperature among the three study stations reveals its importance in the physiology of reproduction, hence the values between 9 °C and 24 °C favored the development of the different populations of individuals by the action of gamete spawning. We note that our results reveal that this abiotic factor has an importance on the spawning phenomenon which is recorded for a temperature between 9 °C and 15 °C for spring and 24 °C to 11 °C for autumn, which is confronted by the values of IGm which fall during these two seasons (Fig. 2).

Variance analysis of the biochemical composition of the gonads and the gut of different populations of *P. lividus* reveal that the interaction of factors (site, season, organ) significantly affects the protein contents (F = 1.80), carbohydrates (F = 1.76) and lipids (F = 2.63) $p < 0.05$.

The gonadal protein content at the first site (S1) is significantly elevated ($p < 0.05$) in winter (45.23 ± 2.54% WW) compared to spring (26,73 ± 6, 33% WW) and autumn (30.81 ± 3.34% WW), however no difference was recorded in summer (37.76 ± 3.34% WW).

For lipids, their percentage in spring (9.58±0.94% WW) and autumn (10.12±3.97% WW) are significantly lower by contribution to summer (14.25 ± 1,55% WW) and winter (14.40 ± 1.39% WW). Concerning percentages of carbohydrate, summer (3.72 ± 0.96%WW) and winter (4.10 ± 0.56%WW) are significantly lower compared to spring (7.21 ± 0.59% WW) and autumn (6.83 ± 0.56% WW).

At the Cap Carbon site (S2), there is a significant difference in protein percentage where values are low in spring (23.88±5.62%PF) and autumn (26.81 ± 4.37% WW) compared with winter (39.79 ± 4.58% WW) whereas the latter did not show any difference with summer (36.56 ± 3.37 % WW). For lipids, the summer season (13.89 ± 1.09% WW) recorded a significantly high difference compared with the spring season (9.52 ± 2.44% WW) and autumn season (9.65 ± 0.56% WW), but no difference with the winter season (13.19 ± 0.66% ww). As for carbohydrates, their percentage is significantly low in summer (3.83 ± 1.26% WW) compared to spring (6.79 ± 1.60% WW) and autumn (7.35 ± 1.89% WW), however no difference was recorded in winter (4.38 ± 1.74% WW) ($p < 0.05$).

About the Benisaf (S3), the protein percentages are significantly high in the summer season (41.80 ± 5.04% WW) and winter season (43.30 ± 2.98%WW) compared to the spring season (26.21 ± 2.59% WW) and autumn season (27.56 ± 2.84% WW).

For lipids, the summer season (14.06 ± 1.28% WW) is significantly elevated by contribution to the spring season (9.25 ± 1.08% WW), however no significance has been obtained with the autumn season (10.13± 0.75% WW) and winter season (13.12 ± 0.66% WW). About carbohydrates, the summer season is significantly low (3.49 ± 0.52% WW) compared to other seasons (Fig. 3).

Concerning the gut, no significant difference was recorded by contributing to the seasonal variation in biochemical components at S1 and S2. Regarding the S3, the percentages of proteins are significantly lower in winter (23.24 ± 6.33% WW) compared with spring (36.33 ± 5.06% WW), however no difference is recorded in summer (27.58 ± 5.74% WW) and autumn (32.77 ± 3.04% WW) (Fig. 4).

For clarity in our results, using the Pearson correlation revealed a significant difference between the percentages of the repletion index and carbohydrates (rs = 0.45) and is very significant with the percentages of proteins (rs = 0.85) and lipids (rs = 0.85) at S1.

The same, significant difference is recorded between the percentages of the repletion index and the carbohydrates (rs = 0.45), and very significant with the percentages of the proteins (rs = 0.85) and lipids (rs = 0.79). For the S2, the explanation is that the percentages, the repletion index and the biochemical components grow in the same direction, but this increase is not significant.

The annual variance analysis of the biochemical composition of the gonads and gut conten of the edible sea urchin *P. lividus* populations revealed no significant differences between the three study stations.

DISCUSSION

The fluctuations of the physiological index (GI, RI) make it possible to follow the gonadic activity according to the approach of the trophic evolution of this Echinid.

The evolution of GI fluctuates from one season to another with a decrease in spring and autumn for the three populations of sea urchins indicating the presence of a double spawning within the populations of *P. lividus* frequenting different stations of the West Algerian coastal fringe. These results obtained are consistent with those of the Spanish and North Mediterranean populations (Guettaf, 1997; Guettaf et al., 2000; Sanchez-España et al., 2004; Sellem & Guillou, 2007; Dermeche et al., 2010; Belkhedim, 2015; Sartori et al., 2015).

Sea urchins tend to have a period of accumulation of nutritive reserve, before each laying, this will allow to store these reserves and to use them during the phase of gametic maturity or there will be consumption of biochemical components stored in the gonads as source of energy (Byrne, 1990; Lozano et al., 1995), from which this phenomenon is seen at its peak in winter and summer.

Fluctuations in RI reveal that during its elevation this would indicate a supply of energy for a gametic maturity, the more the sea urchin feeds, the more it develops its gonads (Lawrence et al., 1989). In Echinoidea, the feeding rate is low when the gonads are highly developed (Lawrence, 1975, 1987; Sellem 1990; Lumingas 1994; Lozano et al., 1995). According to Leighton (1968), the development of the gonads causes a physical decrease in the space of the coelomic cavity, therefore the space available is insufficient for the gut and its content, resulting in a fall of the repletion index (Fig. 5).

However, Lawrence & Lane (1982) suggested that variations in the intestinal index reflected the amount of food consumed. In *Arbacia lixula*, variations in gonadal and intestinal indices were positively correlated and the gonads were not voluminous, so the gut would have a coelomic space for its development (Tavares, 2004).

Edible sea urchin populations are under the influence of the abiotic parameters of the surrounding environment (Fenaux, 1968) and the measurement of the seawater temperature at the three sampling stations revealed that the latter induce spawning between 9 and 15 °C in spring and 24 and 11 °C in autumn.

The temperature of seawater in the natural environment of *P. lividus* varies from 18 °C to 25 °C (Boudouresque & Verlaque, 2007). Le Gall et al. (1990) reported that somatic growth of *P. lividus* was enhanced at temperatures ranging from 18 °C to 20 °C. Fernandez (1996) achieved the best results with the same temperatures. Shpigel et al. (2004) reported that temperature fluctuations between 18-22 ºC improve both gonad growth and development, while by increasing temperature to 24 ºC, growth slows.

According to Régis (1979) and Byrne (1990), the fall in temperature during the coldest and the shortest months of the year triggers the growth of the gonads of the Mediterranean and Irish populations, whereas Spirlet et al. (1998) reports that the increase in seawater temperature in spring triggers gametogenesis. Thus, temperature is a factor influencing the reproductive modalities of *P. lividus* populations (Fenaux, 1968).

Another factor that has been found to be very important in the gonadal development process is the availability of food, which allows them increased access to food (Byrne, 1990), and other factors such as the quality of the biotope, phytoplankton bloom,

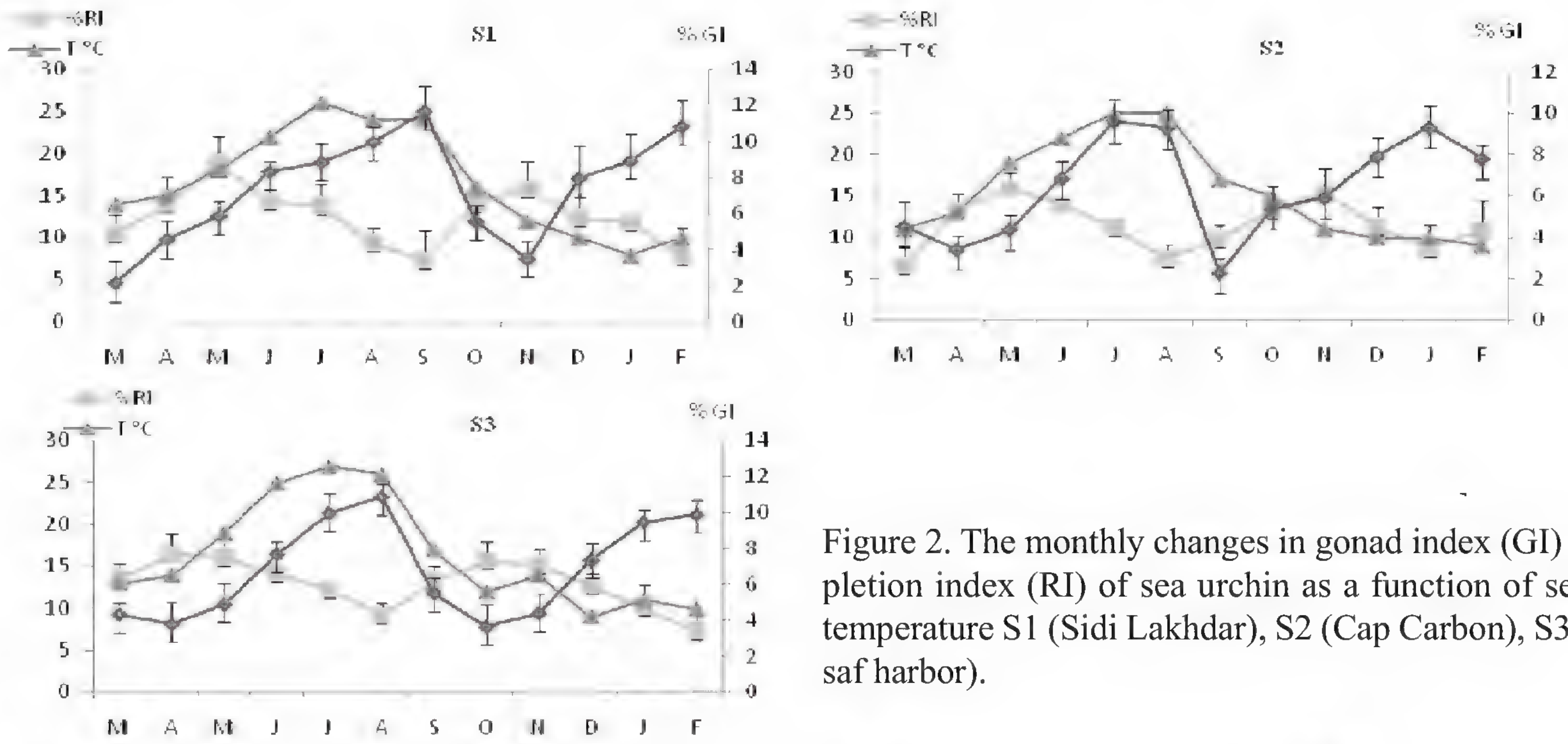

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Figure 2. The monthly changes in gonad index (GI) and repletion index (RI) of sea urchin as a function of seawate temperature S1 (Sidi Lakhdar), S2 (Cap Carbon), S3 (Beni-saf harbor).

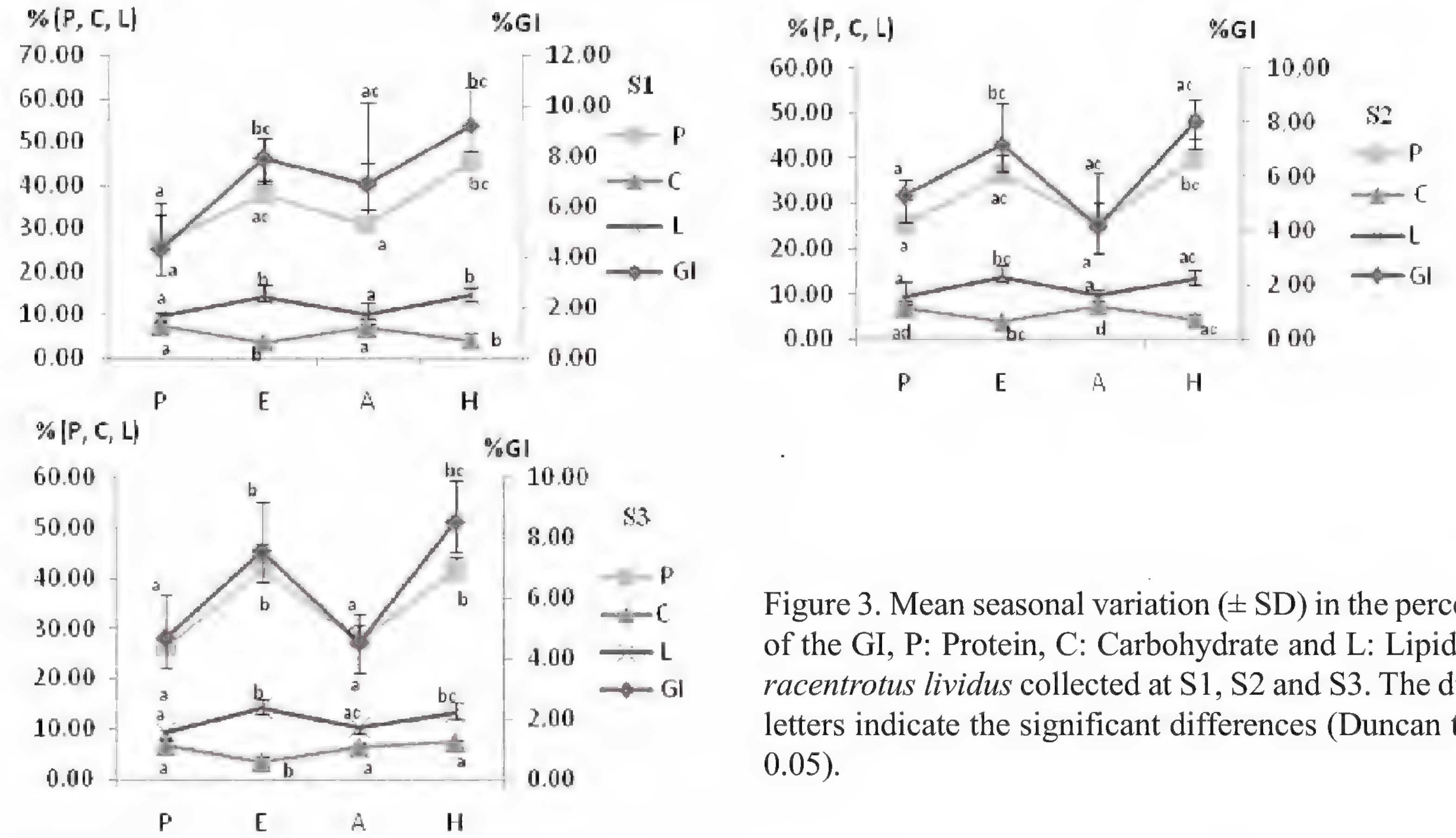

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Figure 3. Mean seasonal variation (± SD) in the percentages of the GI, P: Protein, C: Carbohydrate and L: Lipid of *Paracentrotus lividus* collected at S1, S2 and S3. The different letters indicate the significant differences (Duncan test, P< 0.05).

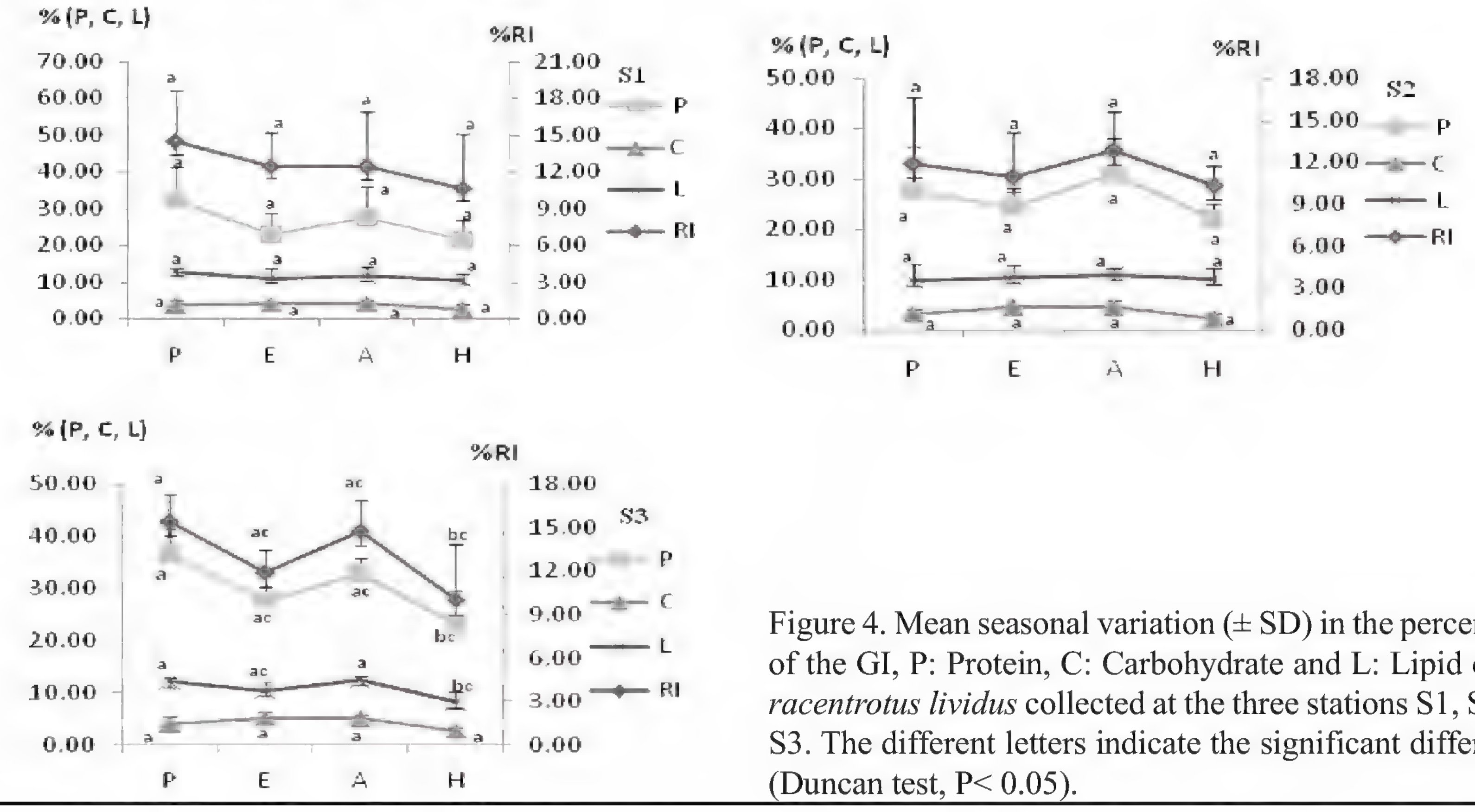

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Figure 4. Mean seasonal variation (± SD) in the percentages of the GI, P: Protein, C: Carbohydrate and L: Lipid of *Paracentrotus lividus* collected at the three stations S1, S2 and S3. The different letters indicate the significant differences (Duncan test, P< 0.05).

Site	Organ	Gonad			Gut		
		% P	% C	% L	% P	% C	% L
S1	P	26 .73±6 .34	7.21±1.17	9.58±0.94	32.52±8.64	3.74±1.25	12.74±1.06
	E	37.76±3.34	3.72±0.96	14.25±1.47	23.04±5.76	4.23±0.19	11.07±2.67
	A	30.81±14.4	6.83±2.07	10.12±4.01	27.35±8.68	4.17±1.00	11.51±2.55
	H	45.23±2.54	4.13±0.86	14.40±1.40	21.43±5.45	2.46±1.54	10.42±1.74
S2	P	25.22±5.62	6.79±1.61	9.52±2.45	27.61±8.74	3.17±0.85	9.67±3.38
	E	36.56±4.12	3.83±1.26	13.89±1.09	24.33±3.94	4.39±0.61	10.23±2.57
	A	25.80±4.37	7.32±1.43	9.65±0.56	30.93±7.22	4.46±1.25	10.98±1.40
	H	39.79±4.58	4.38±1.74	13.19±0.66	21.91±3.06	2.12±1.05	10.08±2.15
S3	P	26.21±2.59	6.60±1.58	9.21±1.09	36.33±5.07	4.06±1.34	12.16±0.7
	E	41.80±5.04	3.49±0.52	14.06±1.28	27.58±5.74	5.22±1.15	10.35±1.83
	A	27.56±2.84	6.37±1.39	10.13±0.75	32.77±3.04	5.12±0.71	12.44±0.61
	H	41.30±2.97	7.39±0.63	13.12±0.66	23.24±6.34	2.87±0.53	8.17±2.09

Table 1. Percentage of seasonal soft tissue biochemical components of sea urchin populations at the three study stations S1 (Sidi Lakhdar), S2 (Cap Carbon), S3 (Benisaf harbor).

photoperiodism, depth and hormones will also influence this physiological process (Himmelman, 1986; Pearse et al., 1988). Not only the accumulation of nutrients by the nutritive phagocytes, but also the accumulation of gametes contribute to gonad growth and weight.

The growth of the gonads, mainly depends on the type of food available, in quantity and quality, as well as the organic matter ingested. According to Regis (1979) and Rico (1989), invertebrates can apparently use as an energetic resource organic matter dissolved in water by absorbing it with their quills (sestenophagy).

In Table 2, the different percentage values of proteins, carbohydrates and lipids are indicated. According to our results, protein is the main component of the gonads and gut followed by lipids and finally carbohydrates with lower proportions.

Such results in the distribution of biochemical components are similar in all echinid species, which vary with the seasons (McClintock et al., 1987; Lawrence et al, 1989; Rowley, 1990; Frantzis & Grémare, 1993; Fernandez, 1996; Fernandez, 1998), quality and quantity of food intake (Cook et al., 1998; Montero-Torreiro & Garcia-Martinez, 2003), temperature variations (Spirlet et al., 1998) and the reproductive cycle (Fenaux et al., 1977; Fernandez, 1998).

The results of the biochemical components obtained in *P. lividus* are close to those of other echinoids, as the case with *Arbacia lixula* (Fenaux et al., 1975, 1977) and *P. lividus* in a lagoon environment (Fernandez, 1996).

Protein levels in the gonadal tissues show significant variations over the study period, corresponding to the highest level with the highest values of the GI, which would be an indication of the protein requirements in gonads during gametogenesis period.

Proteins are considered to be the main nutrient-rich food nutrient involved in reproduction, leading to increased somatic and gonadal growth rates, the latter due to the accumulation of gametes or nutrients (Fernandez & Boudouresque, 1997, 2000; Cook & Kelly, 2007). Gonad weight growth is mainly associated with the ingestion of nutrients, the quantity and quality of food ingested (Lawrence & Lane 1982; Cuesta - Gomez & Sánchez-Saavedra, 2014).

The profile of the total proteins in the digestive content is practically the same as in the gonads, unlike other works, in which the levels have remained practically constant. These facts could be explained by the importance of the diet in the biochemical composition of the digestive content, as well as, by the inverse relationship observed in *P. lividus* between the intake and absorption rates of the food, when conditions are more favorable for the development of algae, coincide with the phase of gametogenesis.

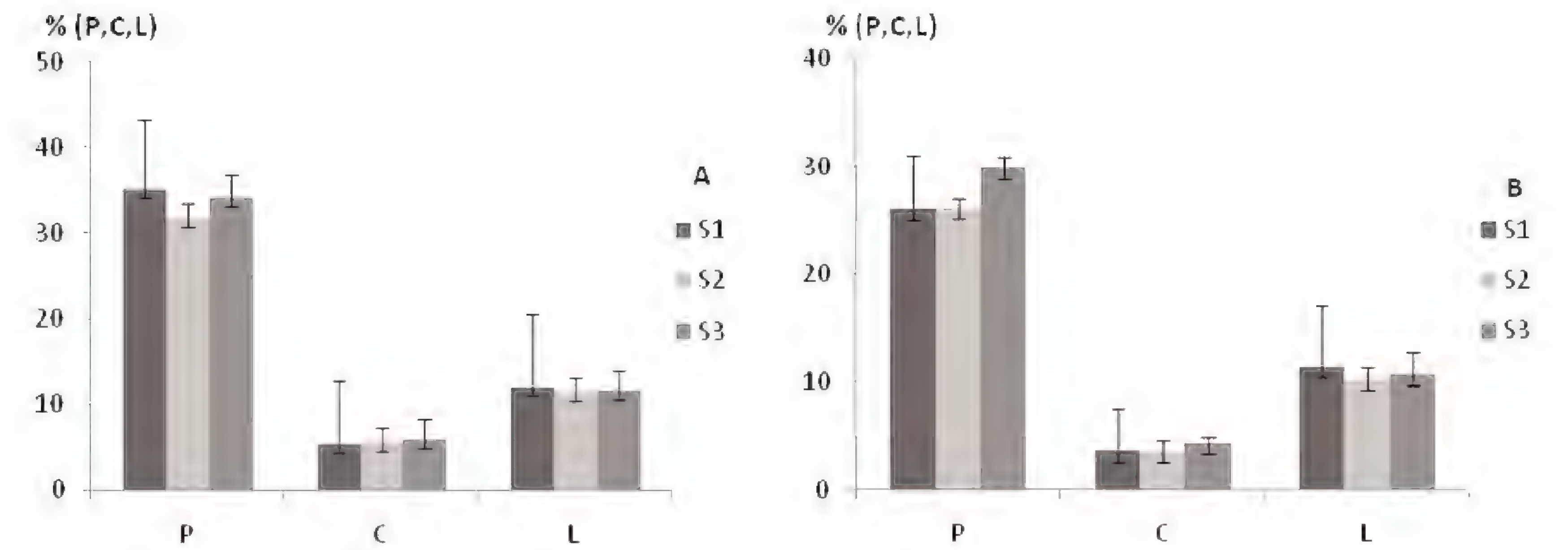

Figure 4. Comparative inter-site study of variation in percentages of biochemical components measured at the n of the gonads (A) and gut content (B). S1 (Sidi Lakhdar), S2 (Cap Carbon), S3 (Benisaf harbor). P: Protein; C: Carbohydrate; L: Lipid.

The maximum protein percentages of the gut content will appear because of the high consumption of macrophyte, but this Echinidae could not absorb such a quantity of proteins, because of the rare musculature associated with *P. lividus*, so the proteins would be retained in the digestive system (Frantzis & Grémare, 1992).

Before initiating gametic development, sea urchin gonads accumulate nutrients in nutrient phagocytes for later use (Walker et al., 2001). In order to carry out gametogenesis, Jangoux & van Impe (1977) observed a decrease in the amount of protein in the *Asterias rubens* Linnaeus, 1758 (Echinodermata Asteroidea), when the gonadal demand in structural material, in the form of amino acids, was high. Gametogenesis requires so much energy that sea urchins prepare for this event, both nutritionally and physiologically (Ferguson, 1975).

As for carbohydrate levels in the gut, they are lower than those of gonadal tissue, a fact that has already been proven in other species of echinids. However, in another study conducted by Fernandez (1998), in *P. lividus*, carbohydrate values in the gut found similar to those of gonadal tissue, which were justified by the role of the digestive tract as an organ reserve.

In contrast, in the gonads, where carbohydrates are required as the primary source of energy during oogenesis, it presents some extra high levels in spring and autumn, according to the theory that glucose is the first source of energy to be used during the gonadal period of development (Ansel, 1974). Patrick et al. (2006) has demonstrated the inverse relationship between gonadal mass and carbohydrate levels in the oyster *Magallana gigas* (Thunberg, 1793) (Mollusca Bivalvia).

It should be noted that there is an inverse relationship between glucose content and total protein in *P. lividus* gonads, which seems to be a clear indication of the use of carbohydrate stores to obtain the energy needed to the synthesis of proteins, which is fundamental in the formation of gametes (Fenaux et al., 1977). Similar situations have been observed in *Strongylocentrotus purpuratus* (Giese, 1966), *Abatus shackletoni* (McClintock & Pearse, 1987), *Arbacia lixula* (Fenaux et al., 1977; Tavares, 2004), *Echinometera lucunter* (Linnaeus, 1758) (Tavares, 2004).) and *P. lividus* (Fernández, 1998, Montero-Torreiro & Garcia-Martinez, 2003) (see also Table 2).

Total lipids in *P. lividus* are affected by the season, lipids suggest nutrient accumulation during gonadal development, values dropped significantly during spawning, which would indicate that deposits observed towards the end of gametogenesis would correspond to storage in gametes. *Psammechinus miliaris* (P.L.S. Müller, 1771) (Echinoidea Parechinidae) showed differences in lipid composition before spawning, whereas the composition was paired after this event, indicating that these components were deposited in the gametes during the last stage of gametogenesis (Hughes et al., 2006).

The total lipids in the digestive tract, unlike the gonadal, do not have a seasonal variation profile. Therefore, it seems clear the direct relationship between total lipids in the gut and the bioavailability of favorable food for algal production, which is the basis of the diet of *P. lividus*. The same conclusion, had already been exposed by Oudejans & van der Sluis (1979), who established that one of the main causes of variation in total lipid levels in the pyloric caeca of the starfish, *Asterias rubens* is the ability of the organ to digest and to accumulate the lipids contained in food.

During periods of gametogenesis, a positive correlation was found between gonadal lipid percentages and gut in sea urchin populations at S1 ($R2 = 0.62$), S2 ($R2 = 0.76$) and S3 ($R2 = 0.93$). For proteins, only S2 and S3 were positively correlated with ($R2 = 0.96$) and ($R2 = 0.95$) respectively. Concerning carbohydrate, a positive correlation was recorded at S1 with ($R2 = 0.94$) and S2 ($R2 = 0.69$).

It has been possible to demonstrate through our results, a transfer of the components, from the gut to the gonads in the populations of sea urchins *P. lividus*, and their use as a source for the biosynthesis of the gametic tissues, which confirms that the gonads and the digestive system are probably dependent organs from the point of view of nutritive and energetic needs in order to properly conduct gametogenesis.

CONCLUSIONS

The evolution of the GI fluctuates monthly with a decrease in spring and autumn, indicating the presence of a double spawning within the different *P. lividus* populations frequenting the west Algerian coastal fringe. The biochemical cycle is directly related to the reproductive cycle, with a higher proportion of proteins, followed by lipids and carbohydrates. The quality of the gonads has been affected by their biochemical composition that change according to their reproductive stages, from the storage of nutrients in the somatic cells provided by the gut to an increase in the number and / or size of gonadal cells.

In *P. lividus*, energy requirements during gametogenesis would be provided by food intake and nutrient transfer observed from intestines to gonads.

Species	Organ	% P	% C	% L	References
Strongylocentrotus purpuratus (Stimpson, 1857)	G Int	32 - 41 41.0 - 49.0	3.3 - 7 18.0 - 20.0	21 – 27 3.1 - 4.6	Lawrence et al.,1966
	G Int	24.0 – 36.9 28.3 – 41.7	2.0 – 7.3 3.10	14.2 – 27.9 20.3 – 30.0	Giese, 1966
Abatus shackletoni Koehler, 1911	G Int	56.2 34.5	4.6 1.6	27.0 3.7	McClintock et Pearse, 1987
Arbacia lixula (Linnaeus, 1758)	G Int	38.1 48.2	5.2 5.8	15.7 18.8	Fenaux et al.,1975
	G Int	30.2 - 51.5 29.9 - 40.5	4 .2 – 7.0 3.4 – 10.2	9.8 – 15.5 13.4 – 18	Fenaux et al.,1977
Paracentrotus lividus (Lamarck, 1816	G Int	39.1 38.1	9.7 20.1	15.6 8.8	Fernandez, 1996
	G Int	30 - 40 33 - 45	5.15 3.4 – 12.6	12 - 18 10.6 – 27.2	Fernandez, 1998
	G Int	36 - 60 24.1 – 42.0	7.1 – 14.0 28.6 – 31.1	12.8 – 16.1 6.4 – 9.9	Montero Torreiro et al.,1998
	G Int	25.8 – 45.2 21.9 – 34.6	3.4 – 7.0 2.1 – 4.9	9.2 – 14.4 9.6 – 12.7	present study

Table 2. Comparative table of the biochemical composition of the gonads and intestines expressed as a percentage: Protein (P), Carbohydrate (C) and Lipid (L) in different Echinid Species. G: Gonads, Int: Intestine.

This further confirms that echinoid gonads behave as an organ that tends to provide two functions: gamete production and energy storage.

Variations in the availability and quality of food in different habitats did not significantly affect the physiology of sea urchin populations, which is possible due to the high phenotypic plasticity of adaptation of *P. lividus* to the environment, conditions and way of life as well as a decrease in metabolic demand and / or a decrease in growth when individuals are important in their size, so the need for food is less important, while the reproductive power is maintained (Fernandez, 1996). Confirmed by some echinoids that feed at a low rate and the gonads are fully developed, similarly, a positive correlation is found between the gonadal and repletion index and this did not affect the development of the sea urchin as the gonads were not voluminous.

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Odonata of Sicilian southeast swamp lakes "Pantano Cuba" and "Pantano Longarini" (SE-Sicily, Italy)

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ABSTRACT From March 2015 to December 2019 a focused study on Odonata, funded by the German foundation "Stiftung Pro Artenvielfalt ®" (Foundation Pro Biodiversity), was conducted at the swamp lakes named "Pantano Cuba" and "Pantano Longarini", in the southeast coast of Sicily (Italy), near Pachino, Siracusa. A total of 27 different species were recorded in Pantano Cuba and Longarini, including *Brachytron pratense* (Müller, 1764), found for the first time in Sicily during this study and *Pantala flavescens* (Fabricius, 1798), never seen before in Italy excluding the islands of Linosa and Lampedusa, Sicilian Channel.

KEY WORDS Odonata; dragonflies; Sicily; Pantano Longarini; Stiftung Pro Artenvielfalt.

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INTRODUCTION

Up to date, 165 species of Odonata are so far reported for the Mediterranean basin area (Boudot et al., 2009; Boudot & Kalkman, 2015; Galliani et al., 2017), 144 in Europe and 96 of them recorded in Italy, of which about 56 occurring in Sicily (Riservato et al., 2014; Surdo, 2017; Viganò et al., 2017). The relatively low number of species in Sicily (Italy) is probably due to the scarcity of aquatic habitats on the island or, partially, for lack of knowledge. This short note is a small contribute to the information on Sicilian dragonflies. A focused study on Odonata was conducted at the swamp lakes named "Pantano Longarini" and "Pantano Cuba", in the southeast coast of Sicily, near Pachino and Ispica, respectively in the Siracusa and Ragusa province.

MATERIAL AND METHODS

Study area

This study area, Pantano Longarini and Pantano Cuba (southeastern Sicily, Italy), that extends for no less than 300 ha, represents the southernmost Italian wetland complex and one of the most important coastal wetland of southern Europe (Figs. 1–3). Together with seven smaller swamp wetlands along the southern coastline (named, from East to West, Ponterio, Ciaramiraro, Baronello, Auruca, Cannone, Bruno, Gorgo Salato), the whole wetland-complex is included in the Natura 2000 network, a network of nature protection areas in the territory of the European Union, as Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) designated respectively under the Habitats Directive and Birds Directive. Due to their great relevance for the Mediterranean biodiversity protection, Pantano Cuba and Pantano Longarini were bought, starting from 2013, by the German foundation “Stiftung Pro Artenvielfalt ®” - Foundation Pro Biodiversity, which is specialized on biodiversity conservation and management, the same foundation that has promoted and funded the here published survey. Pantano Cuba and Pantano Longarini are dynamic habitats characterized by shallow, brackish and standing waters, surrounded by a variable and diversified vegetation. Here we report the results of our researches in the mentioned area.

Samples

The method of capture-identification-release was used walking through transepts in the five most representative habitats of the monitored area of Pantano Cuba and Pantano Longarini (ponds and canals, open meadows, edge of reed beds, Mediterranean scrub, ecotonal habitats and uncultivated fields). The length of each of the 5 transepts was fixed at 1 kilometer to go through in 30 minutes, always during the morning and with good weather conditions (no rain and no wind), when the dragonflies activity is more intense. They were executed once for week, from March 2015 to December 2019. The identification was made mainly collecting and releasing the specimens with entomological nets, or, in other cases, through direct observation with binocular and collection of photographic material. Alongside with the new data collected during this study, unpublished data collected during previous years are also reported, in order to have, for the first time, a complete picture about the Odonata found in this important area.

RESULTS

Systematics

Ordo ODONATA Fabricius, 1793
Subordo ZYGOPTERA de Sélys Longchamps, 1854
Familia CALOPTERYGIDAE Sélys, 1850
Genus *Calopteryx* Leach, 1815

Calopteryx haemorrhoidalis (Vander Linden, 1825)

Despite being pretty common in the southeast

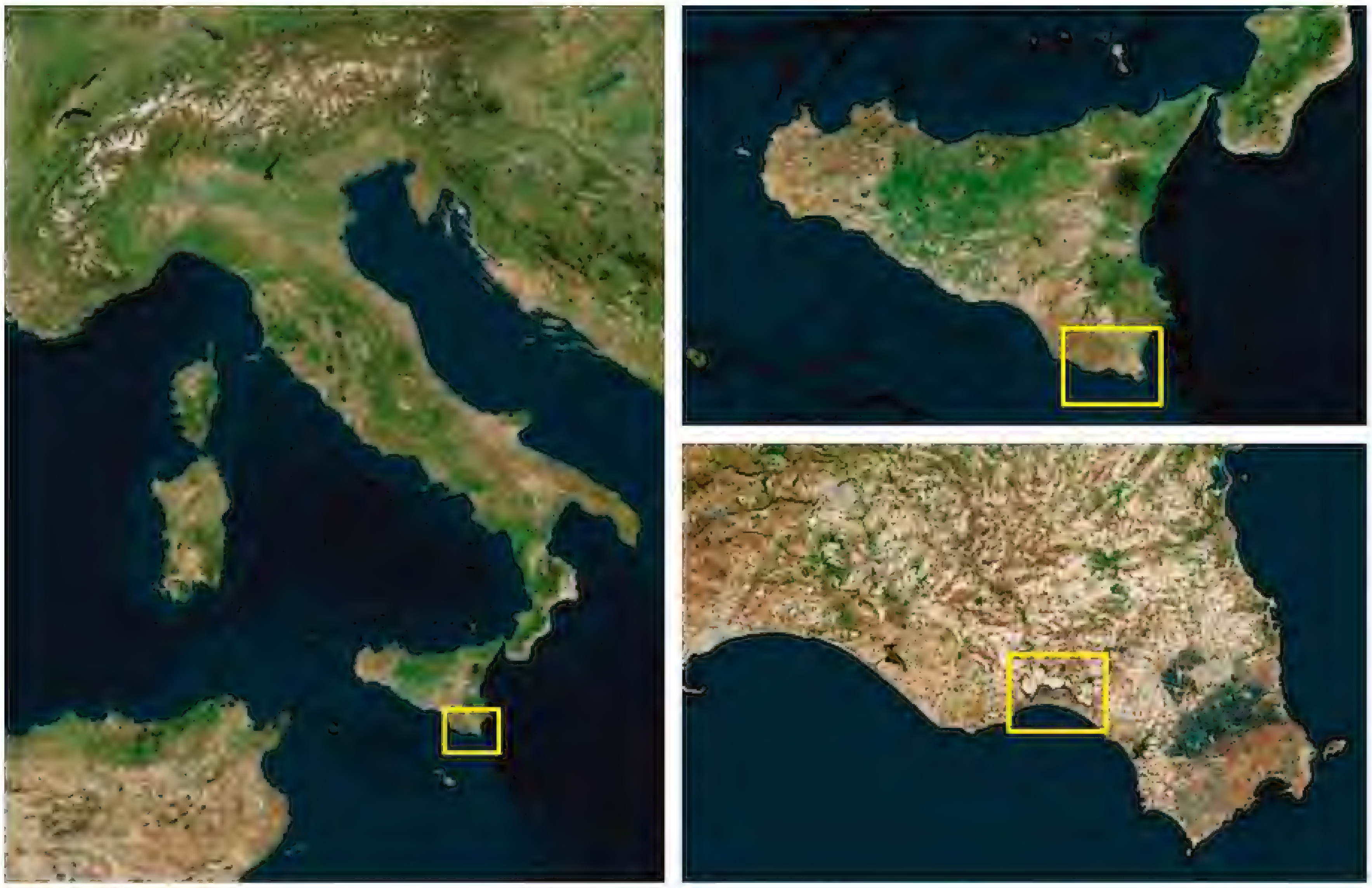


Figure 1. Geographical location of the study area: Pantano Cuba and Pantano Longarini (southeastern Sicily, Italy).

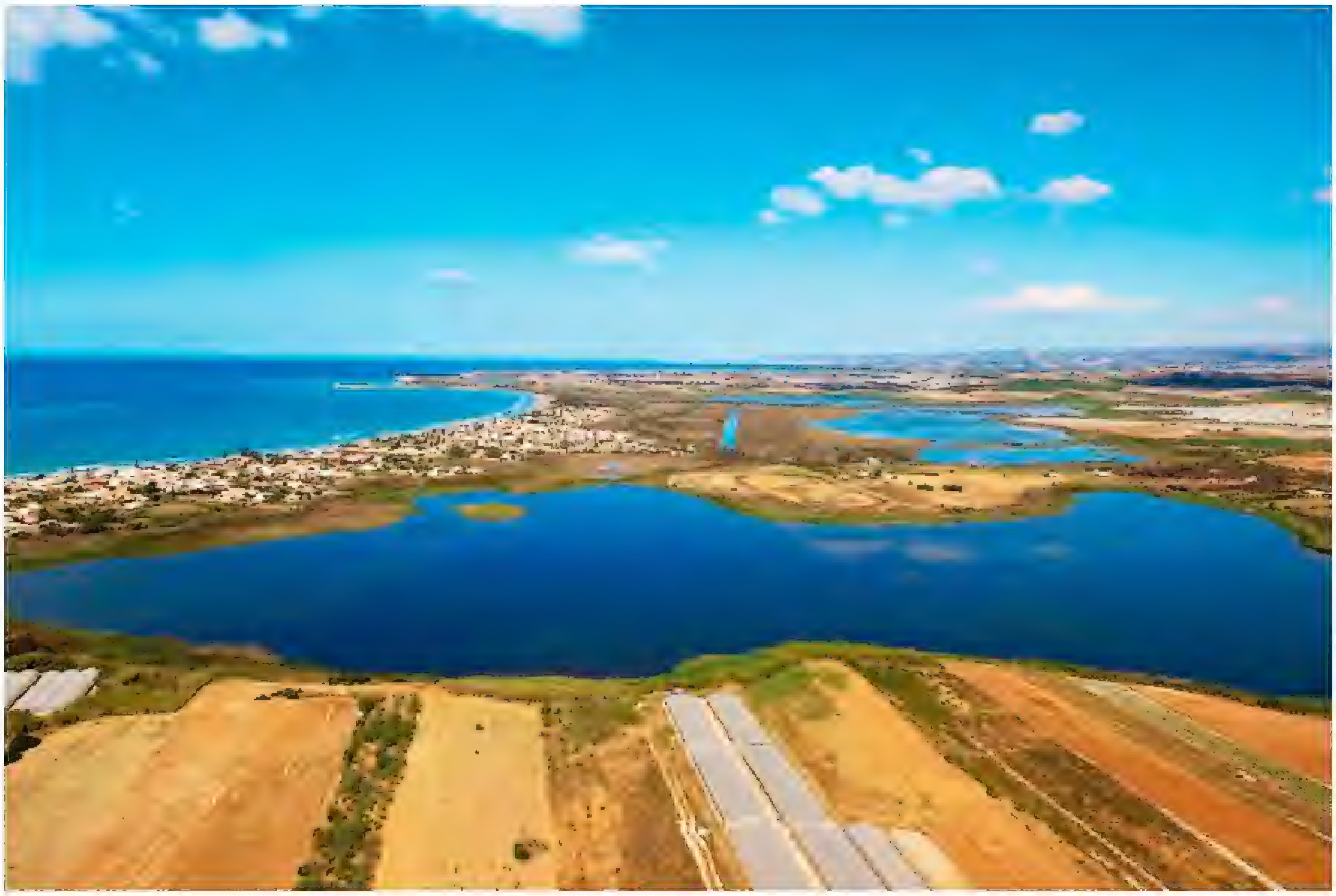


Figure 2. Pantano Cuba, southeastern Sicily, Italy (photo ©SPA_IT).

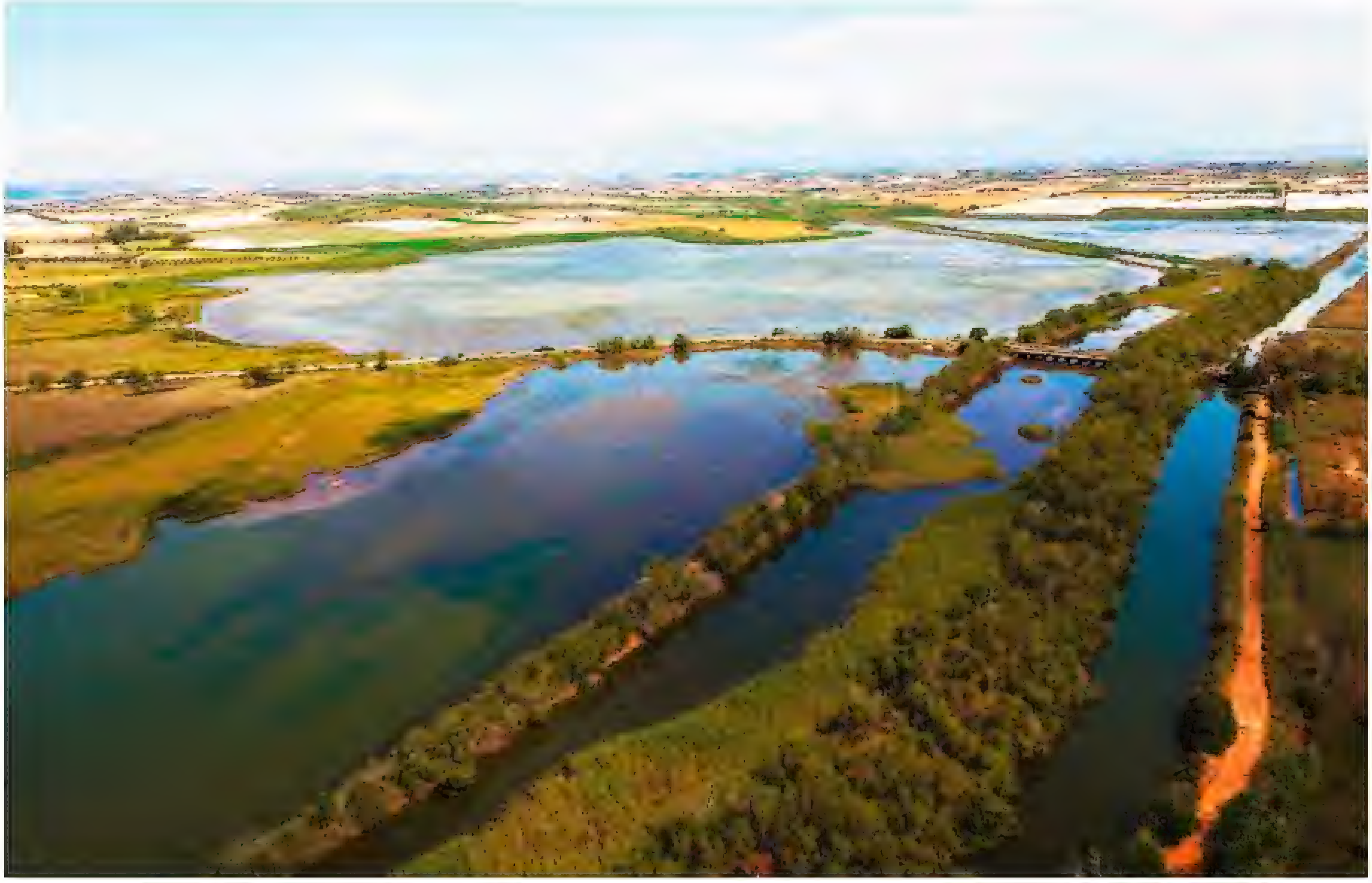


Figure 3. Pantano Longarini, southeastern Sicily, Italy (photo ©SPA_IT).

of Sicily due to the lack of habitat with fresh and running water in the area, only 3 specimens of this species were observed: 2 females in Pantano Cuba, 1 at the end of March 2018 and 1 in October 2018 and 1 male in the northside of Pantano Longarini in October 2019. Reproduction of this species in the area is possible but not confirmed.

Familia LESTIDAE Calvert, 1901
Genus *Sympecma* Burmeister, 1839

Sympecma fusca (Vander Linden, 1820)

Only 4 specimens observed in Pantano Cuba: 1 male in March 2015 that probably wintered in the area, 2 females in April 2016, 1 male in late March 2017. Reproduction of this species in the area is probable but has not been confirmed.

Genus *Chalcolestes* Kennedy, 1920

Chalcolestes viridis (Vander Linden, 1825)

First report in Pantano Cuba on 13.X.2019. (Cappuzzello & Gambino, pers. obs.). Subsequently, observed exclusively throughout the month of October 2019, with no less than 6–10 specimens at a time, males and females, also during the mating and oviposition.

Genus *Lestes* Leach, 1815

Lestes barbarus (Fabricius, 1798)

The commonest Lestidae in the area; many subjects observed all years of the study, in Pantano Cuba and Longarini, mainly in April/May and in August/September in wooden habitat close to the water represented by *Acacia saligna* or *Tamarix* sp., often associated to *Limbarda crithmoides*. Ascertained reproduction on the study area.

Lestes virens (Charpentier, 1825)

Frequently observed in late May/June 2015 in Pantano Cuba and Longarini as well, and in late August/September 2019 in Cuba in different habitat, mostly close to the water with vegetation including *Limbarda crithmoides* associated to *Limonium* sp. or in ecotonal habitat as shaded edges of fruit gardens. Only few subjects observed in the 2016 and no one during 2017–18. Reproduction of this species in the area is highly probable but has not been confirmed.

Familia COENAGRIONIDAE Kirby, 1890
Genus *Ceriagrion* Selys, 1876

Ceriagrion tenellum (de Villers, 1789)

Males, females and specimens just emerged were observed in Pantano Cuba, all years of the study, exclusively in the fresh water canals transept, where the reproduction has been ascertained.

Coenagrion scitulum (Rambur, 1842)

Species recorded only in May 2015 in Pantano Cuba (but pretty common in similar habitat and areas with fresh water) with few subjects (5–7), adult males and females, observed in open habitat far enough from the water.

Genus *Erythromma* Charpentier, 1840

Erythromma viridulum (Charpentier, 1840)

Only 1 male observed and photographed at Pantano Cuba in an open meadow on 2.V.2015. This is an interesting data, given the fact that in very similar habitat in Southern Sicily, the species is very common (pers. obs.).

Genus *Ischnura* Charpentier, 1840

Ischnura genei (Rambur, 1842)

The most common Coenagrionidae in the area; observed almost throughout the years of the study (including months of December and February) in different habitats, with peaks in May/June. Ascertained reproduction on the study area.

Subordo ANISOPTERA de Sélys Longchamps, 1854
Familia AESHNIDAE Rambur, 1842
Genus *Aeshna* Fabricius, 1775

Aeshna affinis (Vander Linden, 1820)

Only a few recorded in Pantano Cuba and Longarini during the seasons 2009–2011 (Corso, pers. obs.) and in August 2017 and 2019 in Pantano Cuba, always with single specimens and without any signs of reproduction in the area.

Aeshna isosceles (Müller, 1767)

Regularly observed, mostly in May/June, in different types of habitats but mainly close to fresh water pools and canals. Ascertained reproduction on the study area.

Aeshna mixta (Latreille, 1805)

Observed in the whole study period in the area, from late July to November with huge peaks in October. Mostly observed close to the water in habitat with *Bolboschoenus maritimus*. Ascertained reproduction on the study area.

Genus *Anax* Leach, 1815

Anax imperator (Leach, 1815)

Common species, observed almost throughout the years of the study in different habitats, with peaks in August/September until to October. Ascertained reproduction on the study area.

Anax parthenope (Selys, 1839)

Quite common species, observed all the years of the study in different habitats, from March to November, with peaks in September/October. Ascertained reproduction on the study area.

Anax ephippiger (Burmeister, 1839)

Few specimens regularly observed every year in October/ November without any signs of reproduction in the area, mostly in open meadow, both in Pantano Cuba and Longarini.

Genus *Brachytron* Evans, 1845

Brachytron pratense (Müller, 1764)

Species recorded for the first time in Sicily during this study (Galasso et al, 2016). Regularly observed in every single year of the study, from March to June, mostly in May, often in habitat with *Limbarda crithmoides* (Fig. 4) associated to *Limonium* sp. Ascertained reproduction on the study area.

Familia LIBELLULIDAE Rambur, 1842
Genus *Orthetrum* Newman, 1833

Orthetrum cancellatum (Linnaeus, 1758)

Quite common species in the area regularly observed all the years of the study, from May to September but mostly in June, in different habitats. Ascertained reproduction on the study area.

Orthetrum coerulescens (Fabricius, 1798)

Regularly observed all the years of the study, from April to September mainly close to fresh water pools and canals in Pantano Cuba. Ascertained reproduction on the study area.

Orthetrum brunneum (Fonscolombe, 1837)

Despite less common than *Orthetrum coerulescens* and *O. cancellatum* in the study area, few specimens have been observed all the years of the study in Cuba and Longarini, from May to September, mainly close to fresh water pools and canals. Ascertained reproduction on the study area.

Orthetrum trinacria (Selys, 1841)

Observed from late May to November of 2015 and 2016 in Pantano Cuba and Longarini (but not during 2017–19) in open habitats as meadow and uncultivated fields. Ascertained reproduction on the study area.

Genus *Pantala* Hagen, 1861

Pantala flavescens (Fabricius, 1798)

The first confirmed record concern 1 male in Pantano Cuba (36°42'27.10"N 15°1'30.40"E) on 2.XII.2012 (Corso et al., 2017); few specimens were observed in late October/November 2018 in Pantano Cuba and Longarini as well (see also Corso et al., 2012).

Genus *Crocothemis* Brauer, 1868

Crocothemis erythraea (Brullè, 1832)

Very common species regularly observed in both Pantano Cuba and Pantano Longarini all the years of the study, from April to October but mostly in late June/July, in every type of habitat close to the water. Ascertained reproduction on the study area.

Genus *Sympetrum* Newman, 1833

Sympetrum fonscolombii (Selys, 1840)

Very common Libellulidae in the area. Observed regularly every year from late March to December (first observations of the year starting from mid February in Pantano Longarini), with peaks in late April/May and September/October in Pantano Cuba and Longarini. Observed in different habitats, usually open meadow and uncultivated fields, also quite far from water. Ascertained reproduction on the study area.

Sympetrum meridionale (Selys, 1841)

The commonest Libellulidae in this area. Observed regularly every year in different habitats starting from late June-July, with maximum peaks of thousands and thousands, (probably millions), of pairs in late October. Observed also a mating pair in December 2016 and January 2019. A few adults overwinter, with specimens observed into January and February.

Genus *Trithemis* Brauer, 1868

Trithemis annulata (Palisot de Beauvois, 1807)

Despite this species being really common in the surroundings of Ragusa and Siracusa's province, only three observations were made in Pantano Cuba, all regarding mature males, 2 recorded in July 2017 and 1 recorded in early November 2019.

Genus *Selysiothemis* Ris, 1897

Selysiothemis nigra (Vander Linden, 1825)

Only 4 subjects, all adults, reported for Pantano Cuba: 2 females in May 2017, and 1 male and 1 fe-

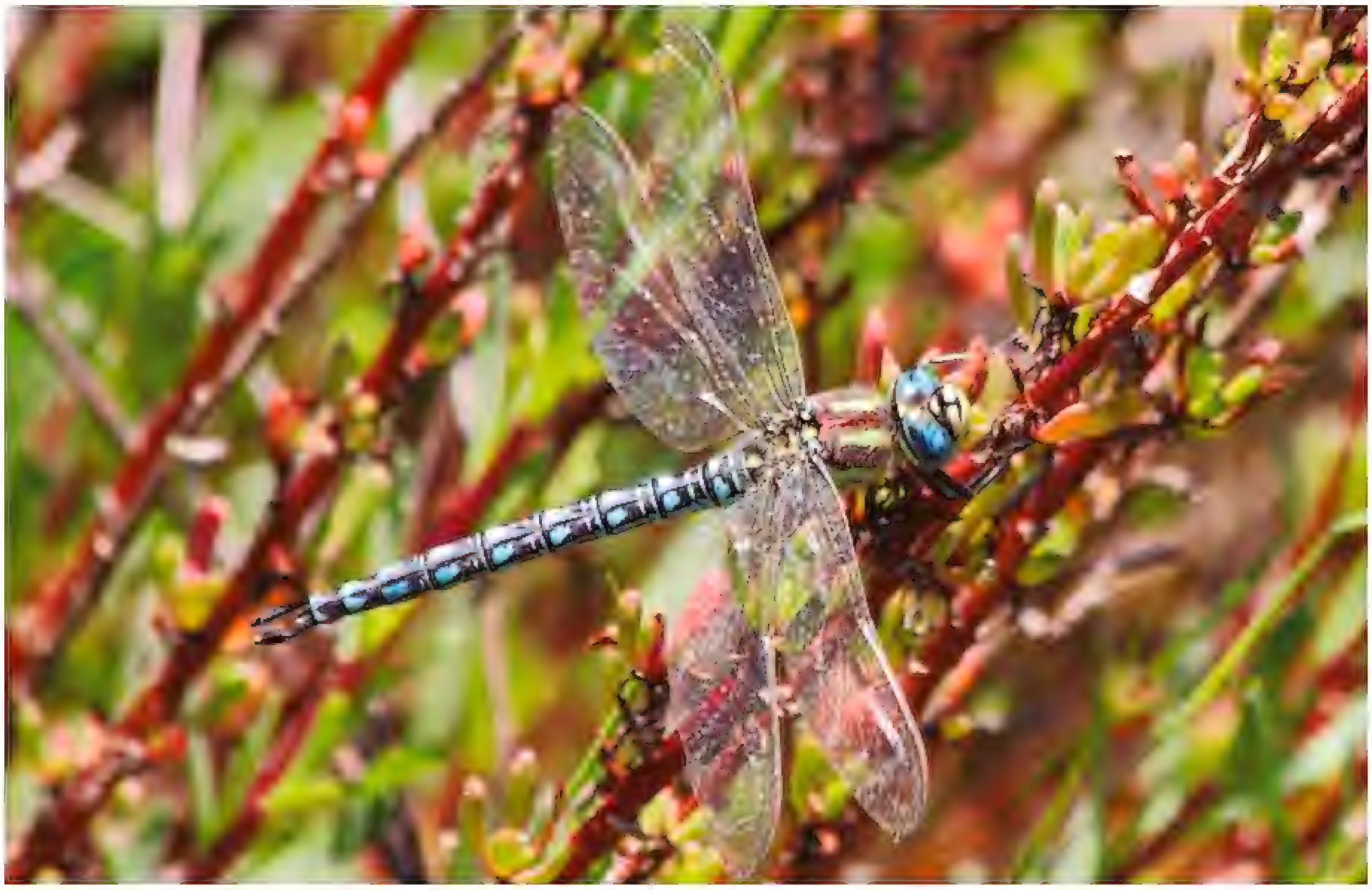


Figure 4. *Brachytron pratense*, adult male on *Limbarda crithmoides* (photo P. Galasso)

male in July 2017; all of them have been observed in open meadow and uncultivated fields, with presence of cereals. No signs of reproduction in the area.

Genus *Brachytemis* Brauer, 1868

Brachytemis impartita (Karsch, 1890)

This species has been reported for different places along the south-east sicilian cost, from Gela to Catania, but only 1 male adult was observed in the area, at the mouth of Pantano Longarini on 6.VIII.2016.

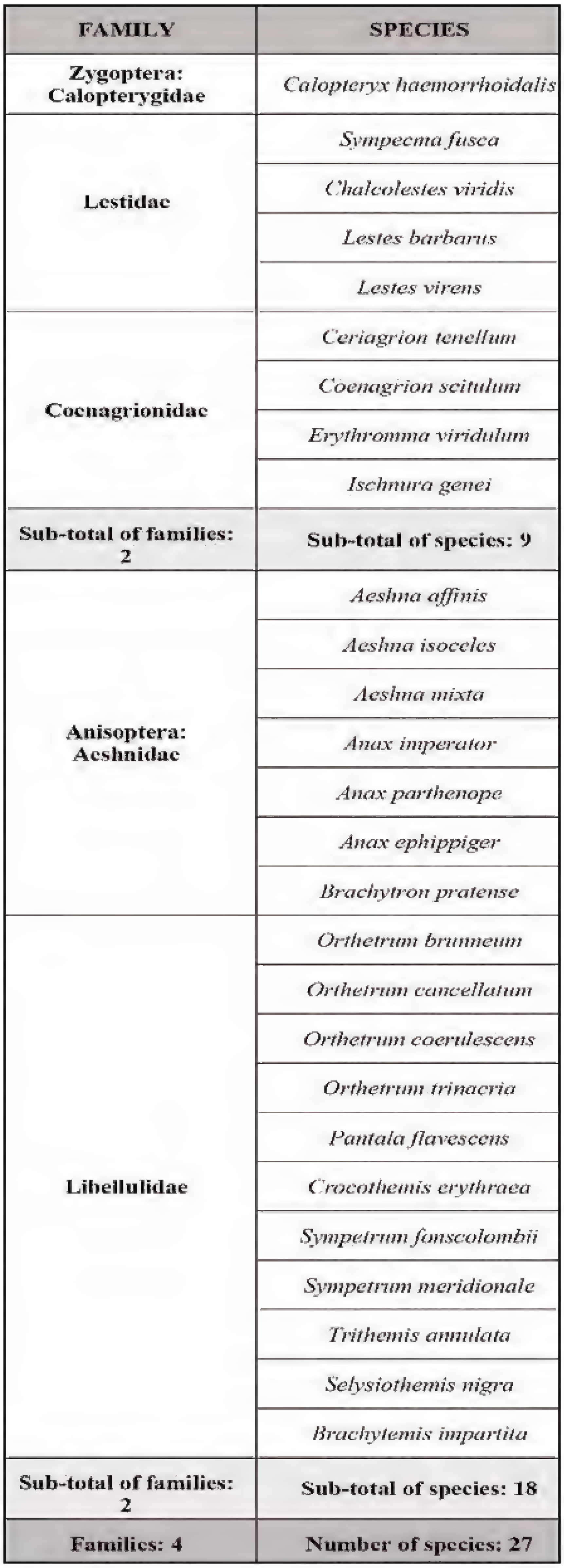
DISCUSSION AND CONCLUSIONS

A total of 27 different species were recorded in Pantano Cuba and Longarini during this study (Table 1). *Brachytron pratense* was found for the first time in Sicily and *Pantala flavescens* (Fabricius, 1798), never seen before in Italy excluding the islands of Linosa and Lampedusa, Sicilian Channel.

This survey represents a first, short but considerable contribute to the information on Sicilian dragonflies and a starting point for a such important area for the biodiversity in the middle of the Mediterranean Basin, never deeply studied until now for this taxa. The management of the German foundation "Stiftung Pro Artenvielfalt ®" - Foundation Pro Biodiversity, owner of this wetland from 2013, has been certainly improving the quality of water and habitats by restoration activities of habitat restoring, water management, invasive plants eradication and native species planting, greenhouses and garbage removal, creation of new ecological niches, etc. The result also involves an improvement of the Odonata community living in the area.

For example, *Chalcolestes viridis* was observed for the first time in 2019, exclusively along one of the water pool specially created by the foundation for the breeding of amphibia and odonata.

After the expiration time of this study, the monitoring of the Odonata population in Pantano Cuba and Longarini has been going on without interruption with the same methods, in order to have an ever more definite picture of these fascinating insects in the next years, and monitoring the effects of the



FAMILY	SPECIES
Zygoptera: Calopterygidae	*Calopteryx haemorrhoidalis*
Lestidae	*Sympecma fusca*
	Chalcolestes viridis
	Lestes barbarus
	Lestes virens
Coenagrionidae	*Ceriagrion tenellum*
	Coenagrion scitulum
	Erythromma viridulum
	Ischnura genei
Sub-total of families: 2	**Sub-total of species: 9**
Anisoptera: Aeshnidae	*Aeshna affinis*
	Aeshna isoceles
	Aeshna mixta
	Anax imperator
	Anax parthenope
	Anax ephippiger
	Brachytron pratense
Libellulidae	*Orthetrum brunneum*
	Orthetrum cancellatum
	Orthetrum coerulescens
	Orthetrum trinacria
	Pantala flavescens
	Crocothemis erythraea
	Sympetrum fonscolombii
	Sympetrum meridionale
	Trithemis annulata
	Selysiothemis nigra
	Brachytemis impartita
Sub-total of families: 2	**Sub-total of species: 18**
Families: 4	**Number of species: 27**

Table 1. List of all the species recorded up to December 2019 in the studied area: Pantano Longarini and Pantano Cuba (southeastern Sicily, Italy).

habitat managing and restoring on the Odonata community of this so important area of the southest coast of Sicily.

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First records of *Diplacodes lefebvrii* (Rambur, 1842) for Sicily and additional record of *Trithemis kirbyi* Selys, 1891(Odonata Libellulidae)

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ABSTRACT We report the first records (three specimens on two dates) of *Diplacodes lefebvrii* (Rambur, 1842) (Odonata Libellulidae) for Sicily, obtained during October 2019 at the island of Linosa, Pelagie Archipelago (Sicily, Italy). Additional record of *Trithemis kirbyi* Selys, 1891 (Odonata Libellulidae), already known for the region, are provided.

KEY WORDS First records; Sicily; Dragonflies; *Diplacodes lefebvrii*; *Trithemis kirbyi*.

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INTRODUCTION

Diplacodes lefebvrii (Rambur, 1842) (Odonata Libellulidae) is a widespread small Libellulidae that is common throughout Africa and distributed across the Indian Ocean into Eurasia and southern Europe (Dijkstra & Lewington, 2006). In the Mediterranean area, it is fairly common in the countries of North Africa. Its European range is confined to Cyprus, the Greek island of Rhodes and the southern half of the Iberian Peninsula (Boudot et al., 2009; Boudot & Kalkman, 2015). In Italy, it was recorded for the first time in September 2013 at Molentargius Salt-pans, Cagliari (South Sardinia), while in October 2014 a small but flourishing population was found on the island of San Pietro, Cagliari (South Sardinia) (Rattu et al., 2014). Since then, the species has continued to colonize Sardinia, with one new site discovered in central Sardinia, in Oristano province in August 2015 (Cillo & Bazzato, 2018) and an additional 14 new sites discovered as of the end of 2019, in the municipalities of Cagliari, Carbonia-Iglesias, Gesturi and Pula, and as far north as Orosei and La Maddalena Island (G. Assandri, pers. com.; P. Leo, pers. com.). Despite these reports, *D. lefebvrii* is not currently known for Sicily or its smaller islands.

Trithemis kirbyi Selys, 1891 is widespread throughout Africa, except in rainforest areas, and in Southern Asia up to India (Dijkstra & Lewington, 2006; Boudot et al., 2009). *Trithemis kirbyi* is not a regular long-distance migrant, its movements being essentially erratic or nomadic; yet it has recently and rapidly expanded its range northwards, spreading into southwestern Europe, including Sicily and Sardinia (Chelmick & Pickess, 2008; Holuša, 2008; Cano-Villegas & Conesa-García, 2009; Herrera-Grao et al., 2012; Corso et al., 2012; Boudot et al., 2009; Obrégon Romero et al., 2013). Global warming is influencing the distribution range of numerous species of Odonata, causing northward expansions, while a tendency towards an increasing range of movements in their migratory patterns has noticed as well (Ott, 2001, 2010; Dijkstra & Lewington, 2006; Bernard et al., 2009).

In this paper, we report the first documented records for Sicily for *D. lefebvrii* and an additional record of *T. kirbyi* to add to those already known for the region (Corso et al., 2012, 2017).

MATERIAL AND METHODS

The Pelagie Archipelago is located in the southern Mediterranean, in the middle of the Sicilian Channel, and comprises the islands of Lampedusa, Lampione and Linosa. The first two are limestone islands and are part of the African tectonic plate. Linosa (35°52'N, 12°52'E) is a small volcanic island of 5.4 km^2, with its highest elevation at 195 m a.s.l. It lies halfway between Sicily and Tunisia, about 160 km from each, and the nearest land is Lampedusa about 42 km to the southwest. Since 2005, Linosa has been visited annually by a group of bird-watchers (MISC) in autumn, and somewhat less regularly in spring as well. In addition to ornithological research (Corso et al. 2009a, b, c, 2013), numerous entomological studies have also been conducted by members of the group in the Pelagie Islands (Corso 2011a, b; Corso et al., 2012; Colonnelli et al., 2016). Odonata were studied in detail by Corso et al. (2012) who reported 20 species from the islands. Our observations of Odonata on Linosa in October and November 2019 were made opportunistically, as part of our daily surveys of migratory birds on the island. Field observations were made by Raimondo Finati, Ottavio Janni, Michele Viganò, Andrea Corso, Luca Giussani, Luca Nigro, Matteo Toller and many other observers. During these surveys, the authors paid careful attention to dragonflies as well, and AC was always equipped with a hand-net and pole, tubes, envelopes and all relevant entomological equipment. All observers were equipped with binoculars and digital cameras. The captured dragonflies were photographed and released shortly thereafter; only one leg was preserved in ethanol 95% for genetic studies.

RESULTS

In October 2019 we photographed 1 female in the field then in the hand at Linosa Island, in a small grassy field in the middle of town (35°51'27.62"N, 12°51'49.99"E), on 26.X.2019 (Fig. 1); 2 females in the northern part of the island, again in a small grassy field, on 28.X.2019 (35°52'15.47"N, 12°51'53.75"E). On 4.XI.2019, 1 male *Trithemis kirbyi* was found on the northern part of the island (35°52'24.48"N, 12°51'52.31"E) (Fig. 2).

DISCUSSION AND CONCLUSIONS

The records of *D. lefebvrii* here reported, along with the continuing range expansion in Sardinia, clearly confirm the predictions made by Dijkstra & Lewington (2006) and Rattu et al. (2014) with an active northward range expansion from Africa. A similarly rapid range expansion was recently noted for the similar *Selysiothemis nigra* (Van der Linden, 1825), which in Italy has been recorded as far north as Lombardy (Odonata.it).

The Pelagie islands are a particularly good area for monitoring the migration and seasonal movements of dragonflies. We have recorded several new species for Italy or even Europe and the Western Palearctic: *Pantala flavescens* (Fabricius, 1798), *Trithemis kirbyi*, *Sympetrum sinaiticum* Dumont, 1977 and *Tramea basilaris* (Palisot de Beauvois, 1807). *Pantala flavescens* it is now regularly recorded while the other three species are rare vagrants recorded only once or a handful times (Corso et al., 2012, 2017; Viganò et al., 2017). Specifically, *T. kirbyi* were reported already three times before with 8 specimens in total; therefore the record here reported it the 4th for Sicily, all at Pelagie Archipelago (9 specimens in tot.).

It is interesting to note that all the specimens of *D. lefebvrii* observed at Linosa were females. Such a sex-ratio in favour of females were noticed, and with a much larger sample, also in Sardinia (Rattu et al, 2014; P. Leo, pers. com.). This is unlike the other vagrant species recorded in Sicily, for which the sex-ratio strongly favoured males (Corso et al., 2012, 2016; Viganò et al., 2017; MISC, unpubl., AC, pers.obs.). Interestingly, a similar sex-ratioin favour of females was noticed for *Selysiothemis nigra* and *Brachythemis impartita* (Karsch, 1890) in Sicily at various sites in the provinces of Siracusa, Ragusa, Catania and Caltanissetta (AC, unpubl.). Farkas et al. (2013) suggest that correlation between water temperature, voltinism and cohort-

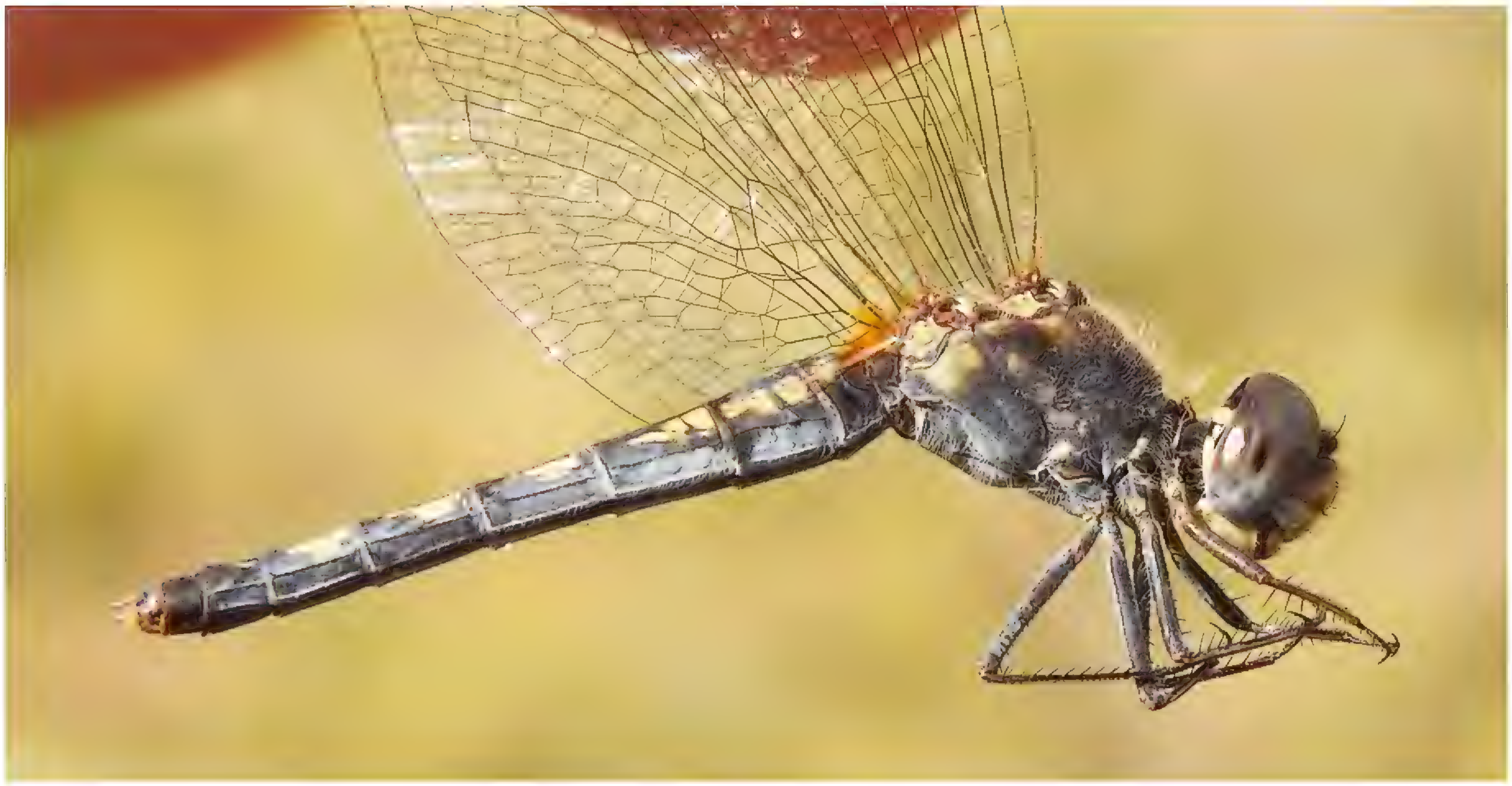

Figure 1. *Diplacodes lefebvrii* mature female, Linosa Island (Sicilian Channel, Italy), 26.X.2019 (photo A. Corso).

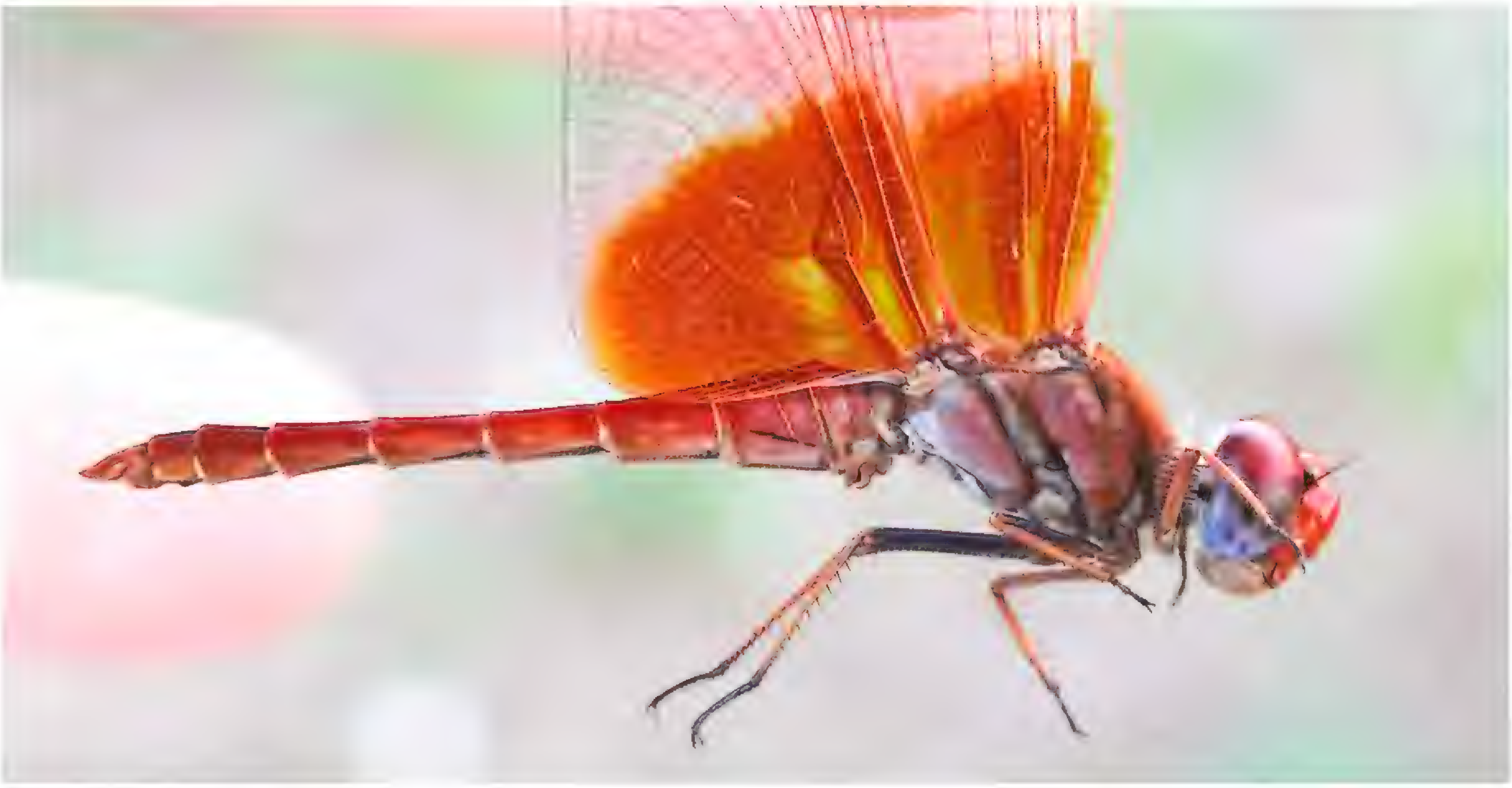

Figure 2. *Trithemis kirbyi* mature male, Linosa Island (Sicilian Channel, Italy), 4.XI.2019 (photo A. Corso).

splitting are potential causes of the variability in dragonfly sex ratios. It should therefore be checked whether the increase in temperatures due to climate change could change the sexual relations of the populations of these Libellulidae (all rather similar to each other) towards a predominance of females.

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Update on the herpetofauna of the Dodecanese Archipelago (Greece)

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ABSTRACT In this paper, an update on the Dodecanese (Greece) herpetofauna is provided. In this Archipelago, 8 Amphibians (2 Salamandrididae,1 Pelobatidae, 2 Bufonidae, 1 Hylidae, 2 Ranidae) and 31 Reptiles (1 Testudinidae, 1 Emydidae, 1 Geoemydidae, 1 Trionychidae, 1 Cheloniidae, 1 Agamidae, 2 Gekkonidae, 4 Lacertidae, 4 Scincidae, 1 Anguidae, 1 Blanidae, 1 Typhlopidae, 1 Boidae, 10 Colubridae, 1 Viperidae) occur. Notes relating to animals' ecology and to critical habitats are also given.

KEY WORDS Dodecanese; Greece; amphibians; reptiles; conservation; herpetofauna.

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INTRODUCTION

Rhodes and all of the islands that make up the Dodecanese Archipelago (Greece) are very important from an environmental and naturalistic point of view. The vertebrate fauna, and in particular the herpetofauna, is particularly interesting and rich. Most of the species are of Anatolian origin because several million years ago these islands where connected with Asia Minor. Recent evidence from the investigation of genetic variation in amphibians and reptiles shows the potential role of the Anatolia region as a major refugium and a source of re-expansion for several amphibian and reptile taxa during the Pliocene and Pleistocene. Unfortunately, a strong anthropic impact, including new forms of agriculture, pollution and global warming, has modified many natural habitats and has led to the rarefaction of some of the herpetofauna species. Numerous studies carried out in the last twenty years have increased the knowledge of the species present on Rhodes and on the Dodecanese Islands. Currently, six species of tortoises and terrapins, fourteen species of saurians, thirteen species of snakes and eight species of amphibians are known to inhabit these islands. It is worth noting that Rhodes Island lacks venomous snakes.

MATERIAL AND METHODS

This work is intended to be an update of the data relating to the herpetofauna of the Dodecanese. The data have been extrapolated mainly from Augusto Cattaneo, which carried out extensive herpetological research in the Aegean islands from 80s of the last century to date, from Mauro Grano and Cristina Cattaneo that began their scientific research in the Aegean area in 2010 and from the international bibliography concerning the study area. The most recent taxonomy was taken into account.

RESULTS AND CONCLUSIONS

Amphibians in the Dodecanese Islands

In the Dodecanese, only eight amphibian species have been found, mainly due to the increasingly dry climate that characterizes this Archipelago. There are, however, two species of salamander, which is particularly interesting given the close dependence that these salamanders also have on aquatic environments. The Karpathos salamander *Lyciasalamandra helverseni* (Pieper, 1963) (σαλαμάνδρα της Καρπάθου) and the Luschan's salamander *Lyciasalamandra luschani* (Steindachner, 1891) (σαλαμάνδρα του Καστελλόριζου) have recently been recognized as two distinct species (Veith & Steinfartz, 2004). The Karpathos salamander has a maximum length of 14 cm, and the females are bigger than the males. It feeds on invertebrates and seeks cooler temperatures and humid conditions, as noted previously. This species occurs on Karpathos, Kasos and Saria (Lymberakis et al., 2009). The Luschan's salamander has the same dimensions and ecological characteristics, but lives only on Kastellorizo where it is represented by the subsp. *basoglui* (Baran & Atatür, 1980).

There is record of the Syrian spade-foot, *Pelobates syriacus* (Boettger, 1889) (πηλοβάτης) on Kos (Dimaki, 2002; Cattaneo, 2005a); Džukic et al., 2008). It is mainly a fossorial species, and the terrestrial habitats in which it lives are generally open, uncultivated lands such as light forests, steppe, semi-desert and rocky areas. It is generally less selective than *Pelobates fuscus* in terms of soil choice, inhabiting not only the soft soils preferred for fossorial life, but also solid, rocky soils and friable clay with pebbles. Spawning sites include: stagnant temporary waterbodies, river or lakeside temporary waterbodies and large permanent pools, but it can also be found in slightly modified environments, such as intensively grazed areas (Agasyan et al., 2009).

The common toad *Bufo bufo* (Linnaeus, 1758) (χωματόφρυνος) has been reported on Kos (Cattaneo, 2005a) (Fig. 1). The common toad is more active in wet seasons and is most commonly found in areas close to the water such as woodlands, forests, marshes and meadows. The common toad is also a nocturnal animal, spending the daylight hours hidden and hunting by night.

Another toad species, the green toad *Bufotes viridis* (Laurenti, 1768) (πράσινος φρύνος), is found on Rhodes, Leros, Lipsi (Broggi, 2008), Kalymnos, Kastellorizo, Kos, Symi and Tilos. This species is dependent on water for reproduction, like most amphibians, but it can also be found in dry habitats and away from water sources. The main threat to its survival appears to be the loss of breeding habitats through wetland drainage, desiccation and aquatic pollution. Local populations may also be declining due to mortality on roads, which often occurs when they are on the move during their reproductive periods (Cattaneo, 2005a, b).

One of the frogs with the most impressively distinctive appearance is the eastern tree frog, *Hyla orientalis* Bedriaga, 1890 (ανατολικός δενδροβάτραχος) which can reach a length of five cm, but is usually shorter, and the females are bigger than the males. Given that *H. orientalis* is mainly nocturnal, and found in reed-beds, bushes and other dense vegetation, it is not easy to spot. Rhodes and Kos are the only islands of the Dodecanese where this species is found. On Kos Island, the largest population is found in the salt lake of Alikes (Cattaneo, 2005a).

The Bedriaga's frog, *Pelophylax bedriagae* (Camerano, 1882) (βάτραχος του Μπεντριάγκα) is found on Kos, Astypalea and Rhodes. In the past, this frog has also been reported on Tilos (Papatheodorou & Pagkas, 2001) but this is not the case in recent times (Broggi, 2006; Cattaneo, 2009; Grano et al., 2018). The total length can reach up to 15 cm, though it is usually shorter. A largely aquatic species, it makes its home in permanent wetlands with rich aquatic vegetation such as: ponds, rain pools, streams, rivers, irrigation channels, reservoirs, marshes, springs and fishponds, though it is sometimes also found in the surrounding terrestrial habitats and can occur in modified habitats where suitable wetlands exist.

The Karpathos frog *Pelophylax cerigensis* (Beerli, Hotz, Tunner, Heppich et Uzzell, 1994) (βάτραχος της Καρπάθου) is an endemic species of Karpathos (Fig. 2). It mates in spring and females lay their eggs in clusters of a few hundred. It is a single island-endemic and it is considered the most endangered anuran amphibian in Europe because its range is restricted to Karpathos island, where it occurs with two populations only in two streams: Nati and Argoni (Temple & Cox, 2009; Pafilis et al., 2019). Both these streams have a much reduced water flow and, especially in the summer period, they decrease into small pools that are sometimes very spaced-out from each other. In addition, the global warming and the low rainfall, contribute negatively to the survival of this species. Due to these reasons, it currently faces a high risk of extinction and is classified as "Critically Endangered" on the red list of IUCN. The *Pelophylax* populations occurring on Rhodes, that were previously assigned to this species, are now allocated to *P. bedriagae* (Lymberakis et al., 2007). Recent studies (Toli et al., 2018) have suggested that specimens from Karpathos and Rhodes constitute a single clade, indicating the occurrence of *P. cerigensis* on Karpathos and Rhodes, which contrasts previous studies, and suggests that further research is needed.

Tortoises and Terrapins

In the Dodecanese the only tortoise species that has been recorded so far is *Testudo graeca,* Linnaeus, 1758 (ελληνηκή χελώνα) (Fig. 3). It is found on Leros, Symi, Kalymnos and Kos with the subspecies *ibera* Pallas, 1814. In addition, a deceased juvenile specimen of *T. graeca* was found on Seskli Islet (south of Symi) in August 2017 by two of the authors of this contribution, M. Grano and C. Cattaneo. Although the species' presence on the islet is very plausible given the proximity to Symi, further confirmation is needed. On Rhodes, south of Lindos, in April 2005, a single juvenile male specimen of *Testudo hermanni*, belonging to the subsp. *boettgeri* Mojsisovics, 1889, was found (Bader et al., 2009). Most likely, the animal escaped or was released from captivity since there were newly built houses in the vicinity. The natural occurrence of *Testudo hermanni* Gmelin, 1789 (μεσογειακή χελώνα) on the Aegean Islands would be less likely due to ecological factors: *T. graeca* chooses drier and more open environments (distinctive features of the Aegean Islands) while *T. hermanni* lives in wetter, grassy habitats. The ecological differentiation remains even where the two species live in syntopy, as happens on the mainland. It is worth noting that *T. graeca* is always parasitized by ticks (*Hyalomma aegyptium*) while this is not the case for *T. hermanni* (Cattaneo, 2008).

With regards to the terrapin species in the Dodecanese Archipelago, *Emys orbicularis* (Linnaeus, 1758) (στικτή νεροχελώνα) (Fig. 4) is reported only on Kos (Broggi & Grillitsch, 2012). The caspian terrapin *Mauremys rivulata* (Valenciennes, 1883) (γραμμωτή νεροχελώνα) is reported on Rhodes, Symi, Tilos and Kos (Broggi, 2012). Only one specimen of *M. rivulata* has been found on Chalki, so its presence on the island requires further investigation (Grano & Cattaneo, 2017). It lives in the lower courses of streams and especially in their estuaries. Populations are currently in decline due to the loss or modification of wetland habitats resulting from land use, tourism and inten-

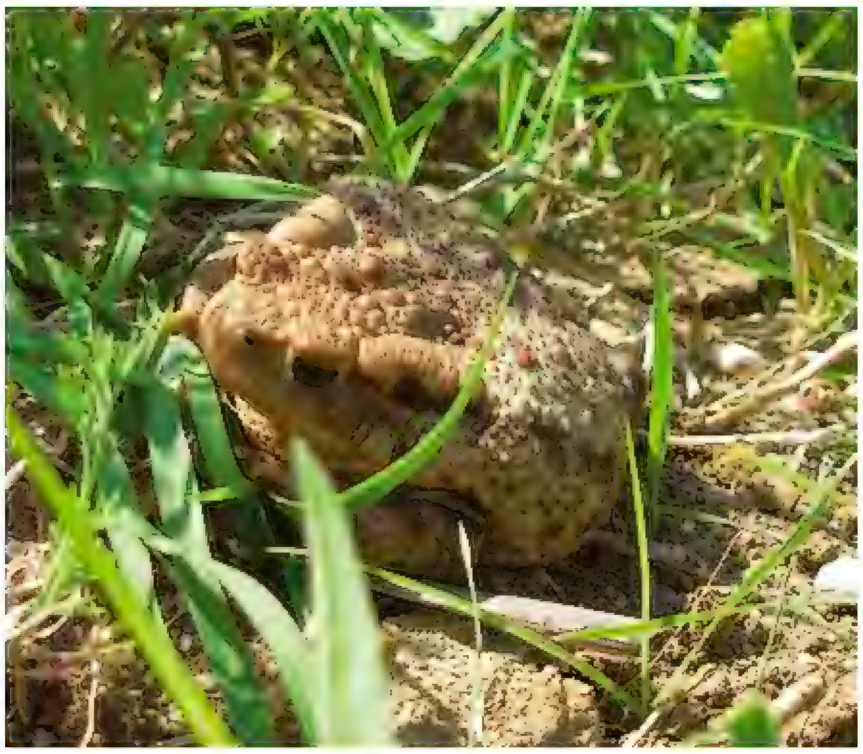


Figure 1. *Bufo bufo* (Kos island).

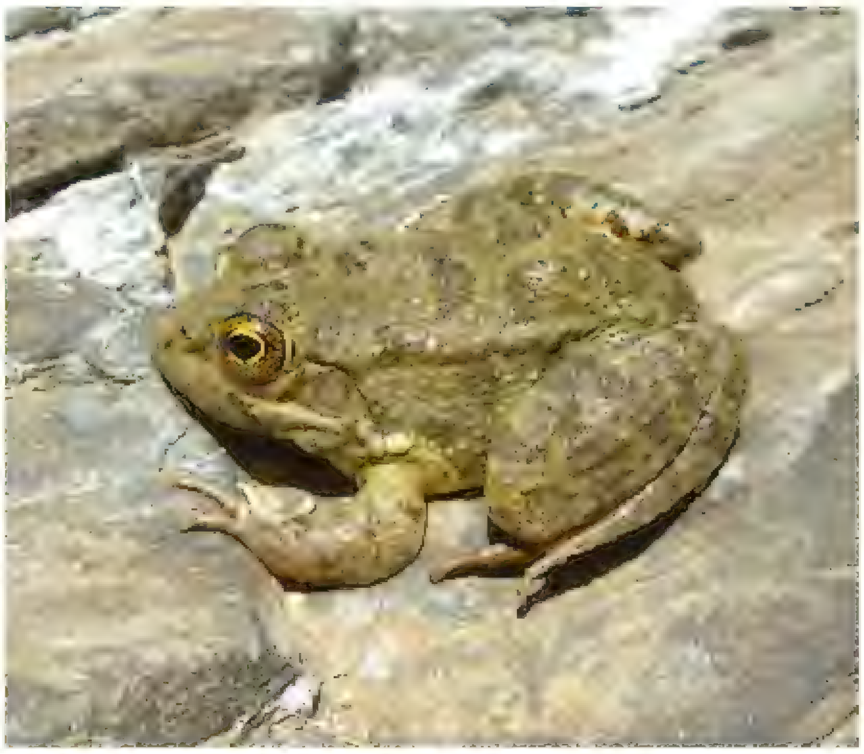


Figure 2. *Pelophylax cerigensis* (Karpathos island).

sive agriculture. It is worth noting that some specimens of *Trionyx triunguis* (Forskål, 1775), a terrapin species that is found in Africa and West Asia, have been detected in the open sea surrounding Rhodes, Leros, Kalymnos and Kos (Taşkavak et al., 1999; Corsini-Foca & Masseti, 2008).

As for marine turtles, *Caretta caretta* (Linnaeus, 1758) (χελώνα καρέττα) and *Chelonia mydas* (Linnaeus, 1758) (πράσινη χελώνα) are found in the Aegean Sea with reports also coming from the Dodecanese Archipelago.

Lizards

In the Dodecanese Archipelago thirteen lizard species have been reported.

Within the family Agamidae, quite common on several islands, we have the rough-tailed rock agama, *Stellagama stellio* (Linnaeus, 1758) (κροκοδειλάκι) (Fig. 5). The genus *Stellagama* Baig, Wagner, Ananjeva et Böhme, 2012 has seven recognized subspecies and two subspecies can be found specifically in Greece: *S. stellio stellio* (Linnaeus, 1758) and *S. stellio daani* (Beutler & Frör, 1980). In the Dodecanese Archipelago, we find *S. stellio daani*, a diurnal lizard that is always found in rocky habitats and in a variety of Mediterranean, arid and semi-arid environments. It can be found on rocks, trees, and stone walls, and has been reported on Leros, Kalymnos, Telendos, Kos, Patmos, Agathonisi, Nisyros, Tilos, Symi, Seskli, Chalki, Alimia (Grano et al., 2015), Karpathos (Grano & Cattaneo, 2019b) Rhodes and Kastellorizo.

With regards to the family Gekkonidae two gecko species are found in the Dodecanese Archipelago: *Hemidactylus turcicus* (Linnaeus, 1758) (σαμιαμίδι) and *Mediodactylus oertzeni* (Boettger, 1888) (κυρτοδάκτυλος).

Hemidactylus turcicus (Linnaeus, 1758) (Fig. 6), the Turkish gecko, is a nocturnal reptile that generally looks for wet environments. It lives in a great variety of stony habitats, such as: building walls, the stone walls found in fields, under stones and inside cisterns. It has been reported on Astypalea, Patmos, Leros, Lipsi, Arki, Agathonisi, Kalymnos, Nisyros (Cattaneo, 2006), Symi, Tilos, Chalki, Alimia, Rhodes, Karpathos, Kasos and Kastellorizo.

Mediodactylus oertzeni (Boettger, 1888) belongs to the *M. kotschyi* complex. *Mediodactylus kotschyi* (Steindachner, 1870) is a small gecko native to southeastern Europe and the Levant, which displays great morphological variation with a large number of recognized subspecies. Through genetic and phylogenetic studies, five new species have been identified within the *M. kotschyi* complex: *M. kotschyi* (Steindachner, 1870) (mainland, Balkans, most of Aegean islands, and Italy), *M. orientalis* (Štěpánek, 1937) (Levant, Cyprus, S-Turkey, and SE-Aegean Islands), *M. danilewskii* (Strauch, 1887) (Black Sea region and SW-

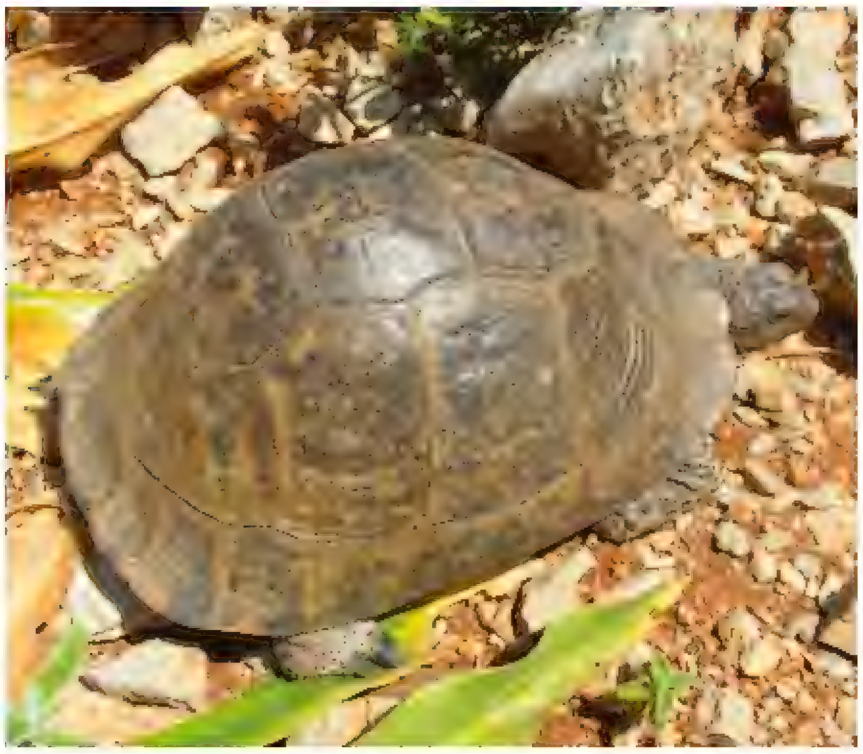


Figure 3. *Testudo graeca* (Symi island).

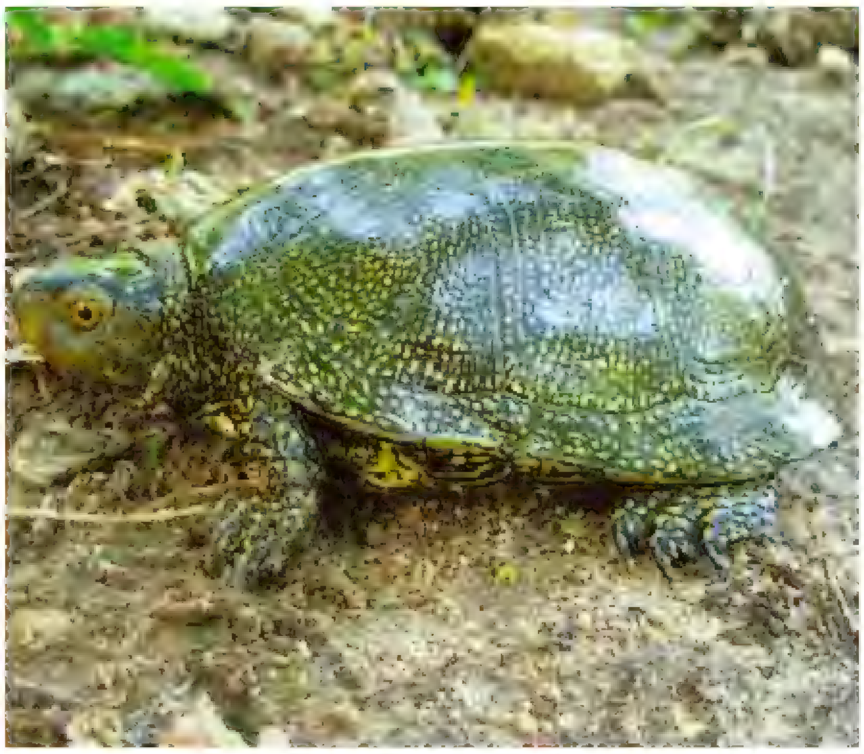


Figure 4. *Emys orbicularis* (Kos island).

Turkey), *M. bartoni* (Štěpánek, 1934) (Crete), and *M. oertzeni* (Boettger, 1888) (Kasos and southern Dodecanese Islands). *Mediodactylus oertzeni* (Boettger, 1888) (raised to the rank of species following the genetic and phylogenetic studies) is found in the Dodecanese Archipelago and specifically on Astypalea, with the two islets Kounoupi and Koutsomyti (pers. obs.), Kalymnos, Symi, Karpathos, Kasos, Saria, Chalki. Instead on Kastellorizo occurs *M. danilewskii*. On Megali Sofrano (south of Astypalea) the subspecies *M. oertzeni stepaneki* (Wettstein, 1937) is present. Only on Kos Island can *Mediodactylus kotschyi kotschyi* (Steindachner, 1870) (Kotsakiozi et al, 2018) be found and on Agathonisi, we find *M. orientalis* (Stepánek, 1937). *Mediodactylus oertzeni*, unlike *Hemidactylus turcicus*, is more diurnal and less anthropophilic. Seeking dry habitats, it is primarily found in arid, stony environments with phryganic vegetation, such as among stones and on stone walls.

Regarding the family Lacertidae in the Dodecanese Archipelago, we find *Anatololacerta pelasgiana* (Mertens, 1959), *Lacerta trilineata* Bedriaga, 1886, *Ophisops elegans* Ménétries, 1832 and *Podarcis erhardii* (Bedriaga, 1876).

Based on recent studies in the Mediterranean basin (Bellati et al., 2015) there are four recognisable species of *Anatololacerta* Arnold, Arribas et Carranza, 2007: *A. anatolica* (Werner, 1900) (W-Turkey, up to the north of the Büyük Menderes River, Samos); *A. pelasgiana* (Mertens, 1959) (SW-Turkey from south of the Büyük Menderes River, Ikaria and some islands of the Dodecanese Archipelago); *A. budaki* (Eiselt & Schmidtler, 1986) (SW-Turkey from Kaş to Antalya); and *A. danfordii* (Günther, 1876), (southeasternmost Turkey, province of Mersin).

Anatololacerta pelasgiana (Mertens, 1959) (πελασγική σαύρα) (Fig. 7) is found in rocky habitats, cultivated areas, and orchards, but also inside villages and towns. In the Dodecanese, it can be found on Nisyros (Cattaneo, 2006), Tilos (Broggi, 2006), Symi and Seskli (subsp. *quandttaylori* Börner, 1974), Alimia, Rhodes, Strongili (NW of Rhodes), on the nearby Pentanisos Islet (subsp. *pentanisiensis* Wettstein, 1964), on Kasos (Kornilios & Thanou, 2016) and on Kastellorizo (Kalaentzis et al., 2018b). Instead on Psomi islet occurs *A. budaki*.

The three-lined lizard, *Lacerta trilineata* Bedriaga, 1886 (τρανόσαυρα) is the largest Lacertide in Greece. It is found throughout the mainland as well as on many islands. It inhabits environments with lower elevations and fairly good vegetation. The *L. trilineata* group comprises three species: *L. media* Lantz & Cyrén, 1920 (from central Turkey and eastwards), *Lacerta pamphylica* Schmidtler, 1975 (central south coast of turkey) and *L. trilineata* Bedriaga, 1886 (Greek mainland and islands). Whereas *L. media* is a morphologically and genetically distinct taxon, the taxonomic situation for the *trilineata* + *pamphylica* clade has historically been problematic. A recent study proposed formal changes to the taxonomy of the *L. trilineata pamphylica* group to properly reflect the phylogenetic relationships (Kornilios et al., 2019). In Greece the following recognisable taxa occur: *L. trilineata trilineata* Bedriaga, 1886 (North Macedonia, Peloponnesos, east of Pindos Mt., including adjacent Aegean and south Ionian islands); *L. trilineata major* Boulenger, 1887 (west of Pindos Mt., including Corfu and Paxos islands); *L. trilineata hansschweizeri* Müller, 1935 (west Cyclades islands: Milos, Kimolos, Polyegos, Kithnos, Serifos, Sifnos); *L. trilineata polylepidota* Wettstein, 1952 (Crete and Kythera island); *L. citrovittata* Werner, 1935 (central Aegean islands: Andros, Tinos, Syros, Mykonos, Naxos, Paros, Antiparos, Ios, possibly other islands); *L. diplochondrodes diplochondrodes* Wettstein, 1953 (Rhodos and Kos islands); *L. diplochondrodes cariensis* Peters, 1964 (Samos, Chios, Lesbos islands); *L. diplochondrodes dobrogica* Fuhn et Mertens, 1959 (northeast Greece).

The snake-eyed lizard, *Ophisops elegans* Ménétries, 1832 (οφίσωψ) (Fig. 8) is a small lizard common to the eastern Aegean islands. It is a very thermophilic species, observable in bushy open environments and arid fields. In the Dodecanese, we find the subspecies *O. elegans macrodactylus* Berthold, 1842 on Astypalea, Patmos, Arki, Agathonisi, Leros, Kalymnos, Telendos, Kos, Nisyros, Symi, Seskli, Tilos (with the islet of Gaidouronisi), Rhodes, Alimia and Karpathos.

The Erhard's wall lizard *Podarcis erhardii* (Bedriaga, 1876) (σιλιβούτι) is highly diversified in Greece and especially in the southern Aegean region. This species shows a great morphological and ecological plasticity and inhabits many different habitats. Out of the 28 recognized subspecies, 27 are found in Greece. It is present on the mainland and in many Aegean Islands (North Sporades, Cyclades and Crete), but it is almost completely absent from the Dodecanese, except for Astypalea and its surrounding islets and Pachia and Pergousa, two islets offshore Nisyros (Valakos et al., 1995), which could be a case of recent colonization from the Cyclades (Poulakakis et al., 2003). Specifically, on Astypalea, Syrna, Dio Adelphi and most likely on Kounoupi and Koutsomyti (pers. obs.) we find *P. erhardii syrinae* (Wettstein, 1937); on Ophidoussa *P. erhardii ophidusae* (Wettstein, 1937); on Megalo Sofrano *P. erhardii zafranae* (Wettstein, 1937); and on Tria Nisia *P. erhardii suboscura* (Wettstein, 1937). Also found on Kinaros is *P. erhardii kinarensis* (Wettstein, 1937), and on Levitha, *P. erhardii levithensis* (Wettstein, 1937).

The family Scincidae in the Dodecanese Archipelago is represented by four species: *Ablepharus kitaibelii* (Bibron & Bory, 1833) (αβλέφαρος), *Chalcides ocellatus* (Forskål, 1775) (λιακόνι), *Ophiomorus punctatissimus* (Bibron & Bory, 1833) (οφιόμορος) and *Heremites auratus* (Linnaeus, 1758) (χρυσίζουσα σαύρα).

Regarding *Ablepharus kitaibelii*, on Kos, Leros, Astypalea (Grano & Cattaneo, 2019a), Makronisi (SW of Lipsi) (Foufopoulos, 1997), Nisyros (Cattaneo, 2006), Tilos (Masseti, 1999), Chalki, Alimia, Symi and Rhodes we find *Ablepharus kitaibelii kitaibelii* (Bibron & Bory, 1833). On Karpathos, Kasos, Armathia and Mikronisi (islet of Crete) instead we find *Ablepharus kitaibelii fabichi* (Štěpánek, 1937). On the island group of Kastellorizo and on the opposite southwest coast of Turkey some individuals of the snake-eyed skink were collected, perhaps belonging to a clade with features of both *A. kitaibelii* and *A. budaki*, which could be ascribed to *A. (budaki) anatolicus* Schmidtler, 1997 and suggests a case of cryptic species that requires further study (Skourtanioti et al., 2016). The snake-eyed skink is usually found in maquis, phrygana and on the ground in leaf litter. It has also been observed in inhabited areas, probably driven there by the increased moisture present.

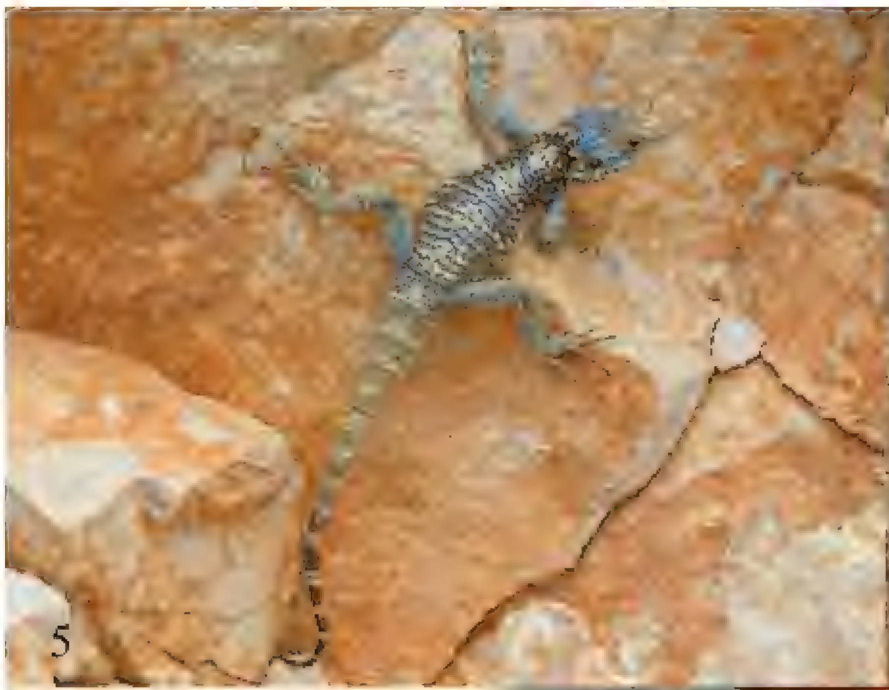
The ocellated skink *Chalcides ocellatus* (Forskål, 1775) is a large skink that is frequently encountered on sandy beaches and in cultivated areas, gardens and leaf litters on Nisyros (Cattaneo, 2006), Rhodes, Pentanisos, Karpathos and Kasos (Kornilios & Thanou, 2016).

The golden skink *Heremites auratus* (Linnaeus, 1758) (Fig. 9) is a species with an eastern distribution and in the Dodecanese is found on Kos, Symi, Rhodes and Kastellorizo. It usually lives in damp places, such as cultivated areas or grasslands near rivers and streams, but it can be also observed between stone walls. Less terrestrial than the previous species, they rarely share the same habitat.

Ophiomorus punctatissimus (Bibron & Bory, 1833) is a limbless skink that occurs in Greece (primarily on the mainland) and south westernTurkey. On the Aegean Islands, it is found only on Kythera and Kastellorizo. Recent genetic and morphological studies have highlighted the divergences between the western and the eastern populations of *O. punctatissimus*, which has led to the identification of the Anatolian population and the population of Kastellorizo, as a separate species: *O. kardesi (*Kornilios, et al., 2018).

Within the family Anguidae, we have the European glass lizard *Pseudopus apodus* (Pallas, 1775) (τυφλίτης), which in Greece is represented by the subspecies *P. apodus thracius* (Obst, 1978). In the Dodecanese Archipelago, it is only found on Kos. In 1953, Wettstein reported its occurrence on Rhodes, but since then no other original reports have been made suggesting further inquiry is required. This legless lizard mainly lives in environments with bushy vegetation, but also in dry rocky places, wooded hills, maquis and phrygana.

Blanus strauchi (Bedriaga, 1884) (αμφίσβαινα) is the only species belonging to the family Blanidae that occurs in Greece. It lives underground, in places with sand or soft soil. It is a rare species, found on Kalymnos, Kos, Pserimos (Sindaco et al., 2014), Leros, Symi, Nisyros (Cattaneo, 2006), Rhodes and Kastellorizo. On these islands, the species is represented by the nominate form. In 1983, one specimen of *Chamaeleo chamaeleon* (Linnaeus, 1758) (μεσογειακός χαμαιλέοντας) was reported on Rhodes (Bader et al., 2009), but it could be a case of passive introduction. According to the literature, this species has been seen on Crete, Chios and Samos, though its presence has only been confirmed on the last island (Valakos et al., 2008).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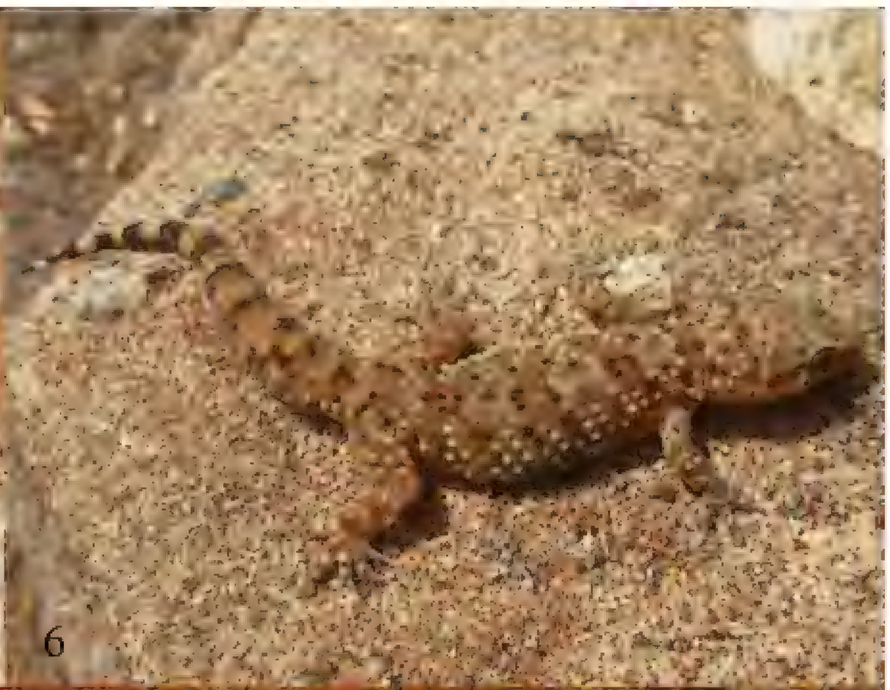
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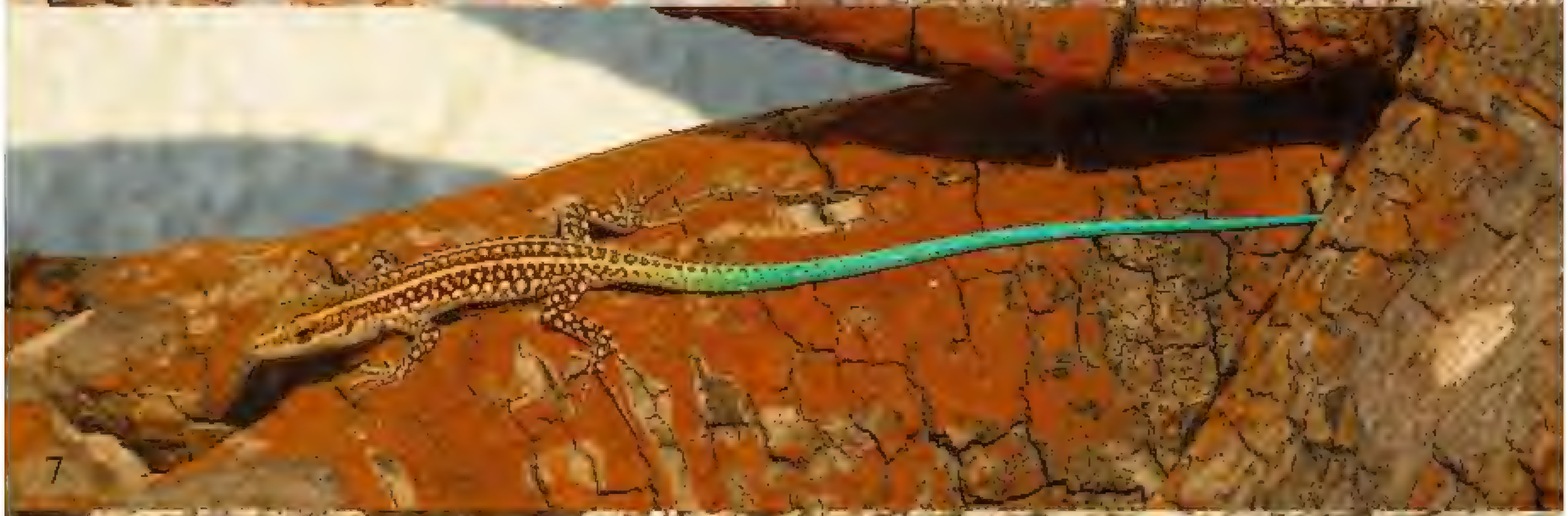
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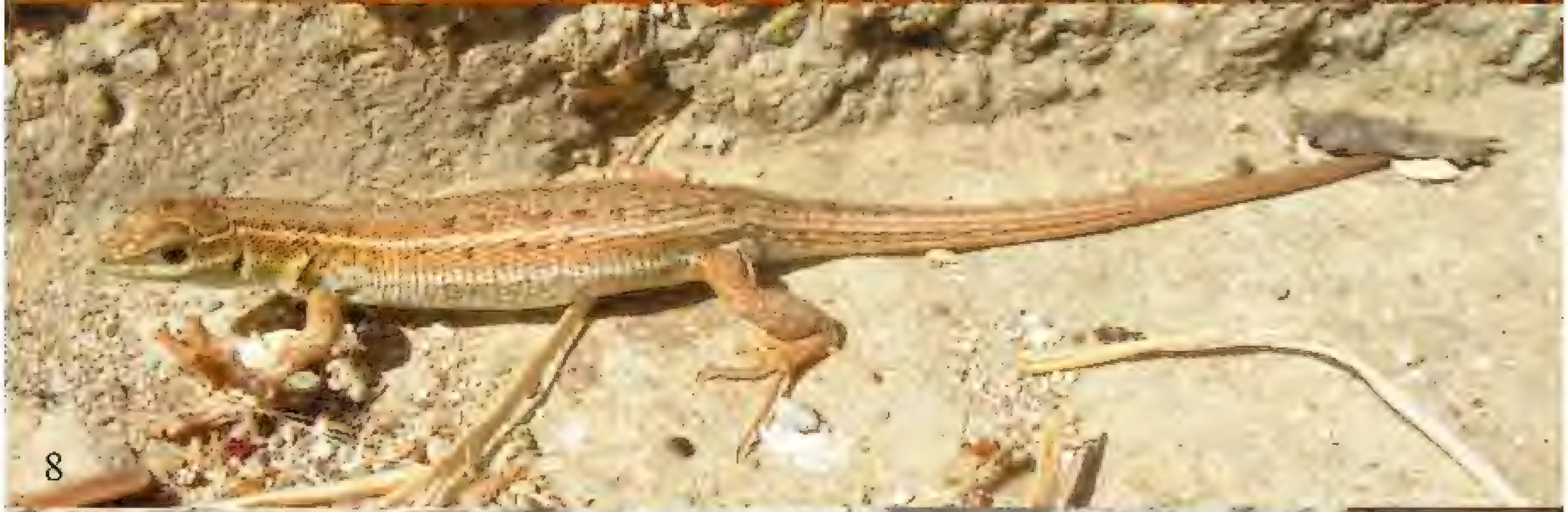
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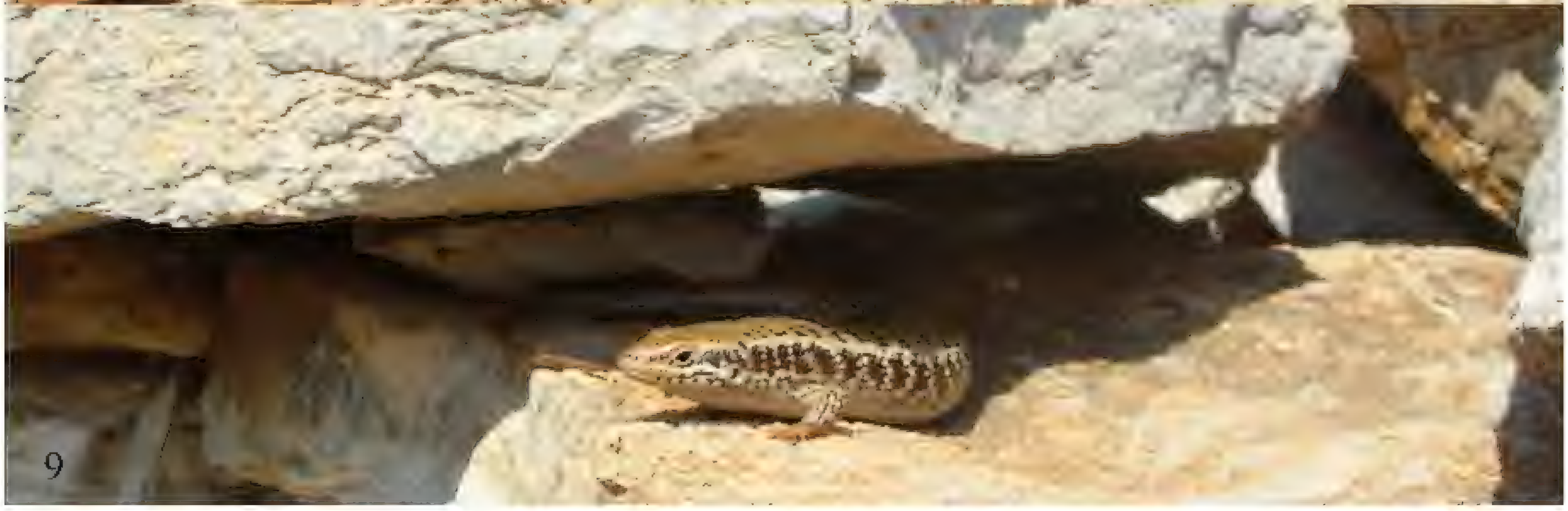
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Figure 5. *Stellagama stellio* (Chalki island). Figure 6. *Hemidactylus turcicus* (Tilos island). Figure 7. *Anatololacerta pelasgiana* (Tilos island). Figure 8. *Ophisops elegans* (Lipsi island). Figure 9. *Heremites auratus* (Symi island).

	AG	AR	PM	LS	LR	KL	TD	PS	KO	AP	NS	SY	SK	TL	RD	PN	CH	AL	KP	KS	SR	AM	KT
Lyciasalamandra helverseni																			X	X	X		
Lyciasalamandra luschani																							X
Pelobates syriacus									X														
Bufo bufo									X														
Bufotes viridis				X	X	X			X			X		X	X								X
Hyla orientalis									X						X								
Pelophylax bedriagae									X	X					X								
Pelophylax cerigensis																			X				
Testudo graeca					X	X			X			X	X										
Emys orbicularis									X														
Mauremys rivulata									X			X		X	X		X						
Trionyx triunguis					X	X			X						X								
Stellagama stellio	X		X		X	X	X		X		X	X	X	X	X		X	X	X				X
Hemidactylus turcicus	X	X	X	X	X	X				X	X	X		X	X		X	X	X	X			X
Mediodactylus kotschyi (s.l.)	X					X			X	X		X		X			X		X	X	X		X
Anatololacerta pelasgiana											X	X	X	X	X	X		X		X			X
Lacerta diplochondrodes									X						X								
Ophisops elegans	X	X	X		X	X	X		X	X	X	X	X	X	X			X	X				
Podarcis erhardii										X#													
Ablepharus kitaibelii					X				X	X	X	X		X	X		X	X	X	X		X	X*
Chalcides ocellatus											X				X	X			X	X			
Heremites auratus									X			X			X								X
Ophiomorus kardesi																							X
Pseudopus apodus									X														
Blanus strauchi					X	X		X	X		X	X			X								X

Table 1. Amphibians, Tortoises and Lizards of the Dodecanese Archipelago (the brackets indicate "presence to be confirmed"). Legend: AG = Agathonisi; AR = Arki; PM = Patmos; LS = Lipsi; LR = Leros; KL = Kalymnos; TD = Telendos; PS = Pserimos; KO = Kos; AP = Astypalea; NS = Nisyros; SY = Symi; SK = Seskli; TL = Tilos; RD = Rodi; PN = Pentanisos; CH = Chalki; AL = Alimia; KP = Karpathos; KS = Kasos; SR = Saria; AM = Armathia; KT = Kastellorizo. * = The populations of Kastellorizo Island could belong to a different species. # = The neighboring islets are also included.

Snakes

Thirteen snake species have been reported in the Dodecanese.

The European blind snake, *Xerotyphlops vermicularis* (Merrem, 1820) (τυφλίνος) is a snake that resembles an earthworm, and is adapted to live underground. It has been reported on Patmos, Leros, Kalymnos, Kos, Symi and Rhodes. The species also occurs on some islands off the south western Turkish coast like Domuz, Tersane and Kizkumu (Lo Cascio & Masseti, 2004).

The Javelin sand boa, *Eryx jaculus* (Linnaeus, 1758) (έρυξ) (Fig. 10), is the only boa species in Europe. This species, much smaller than its "relatives", has been reported on Leros, Kalymnos and Kos, where it is represented by the subsp. *turcicus* (Olivier, 1801).

The European whip snake, *Dolichophis caspius* (Gmelin, 1789) (έφιος) (Fig. 11), is one of the most common snake species. It is a diurnal snake and easily observed, being found in gardens, farms and cultivated lands. In the Dodecanese it has been reported on Agathonisi, Patmos, Kalymnos, Kos, Nisyros and Karpathos. On Nisyros, in addition to specimens with the typical colouring, we also find adult individuals with dorsal spots that vary in pattern from those found in juveniles and are comparable only to the specimens found on the Ionian island of Corfù (Cattaneo, 2006).

The black whip snake, *Dolichophis jugularis* (Linnaeus, 1758) (μαύρος έφιος), is one of the biggest European snakes. It is found only in the Dodecanese and particularly on Leros, Kos, Tilos, Symi, Rhodes, Chalki and Kastellorizo. Its presence is also highly likely on the small islands of Alimia and Seskli. It is also found on the island of Göcek (SW Turkey) (Lo Cascio & Masseti, 2004). On Kos Island, *D. jugularis* coexists with its sister species *D. caspius*. In this case both whip snakes seem to have mostly non-overlapping habitats, with *D. caspius* being more common along wet coastal stretches, and *D. jugularis* mostly seeking out hilly inland areas. Even so, being generic this spatial separation would not exclude areas of syntopy (Cattaneo, 2005b). In the Rhodes Archipelago (Rhodes, Symi, Tilos, Chalki) the endemic subspecies *zinneri* Cattaneo, 2012 is found, mainly characterized by a lessintense colouring than that of the nominate form, both dorsally and ventrally (and often having a yellow belly instead of red). A different head morphometry and a lower number of ventral scales are other distinctive features. On Kos and Leros the nominate subspecies occurs (Cattaneo, 2012).

The ringheaded dwarf snake, *Eirenis modestus* (Martin, 1838) (θαμνόφιδο) (Fig. 12), is a small snake that can be observed in bushes or under stones. It has been reported on Leros, Kalymnos, Symi, Seskli and Kastellorizo. It is also found on Kameriye Island (SW Turkey) (Lo Cascio & Masseti, 2004). On the islands of the eastern Aegean arc (and therefore also in the Dodecanese) the subspecies *semimaculatus* (Boettger, 1876) occurs with two phenotypes: one spotless and one with dark spots distributed on the first half of the body. Melanotic specimens have also been found on the island of Kastellorizo (Kalaentzis et al., 2018a).

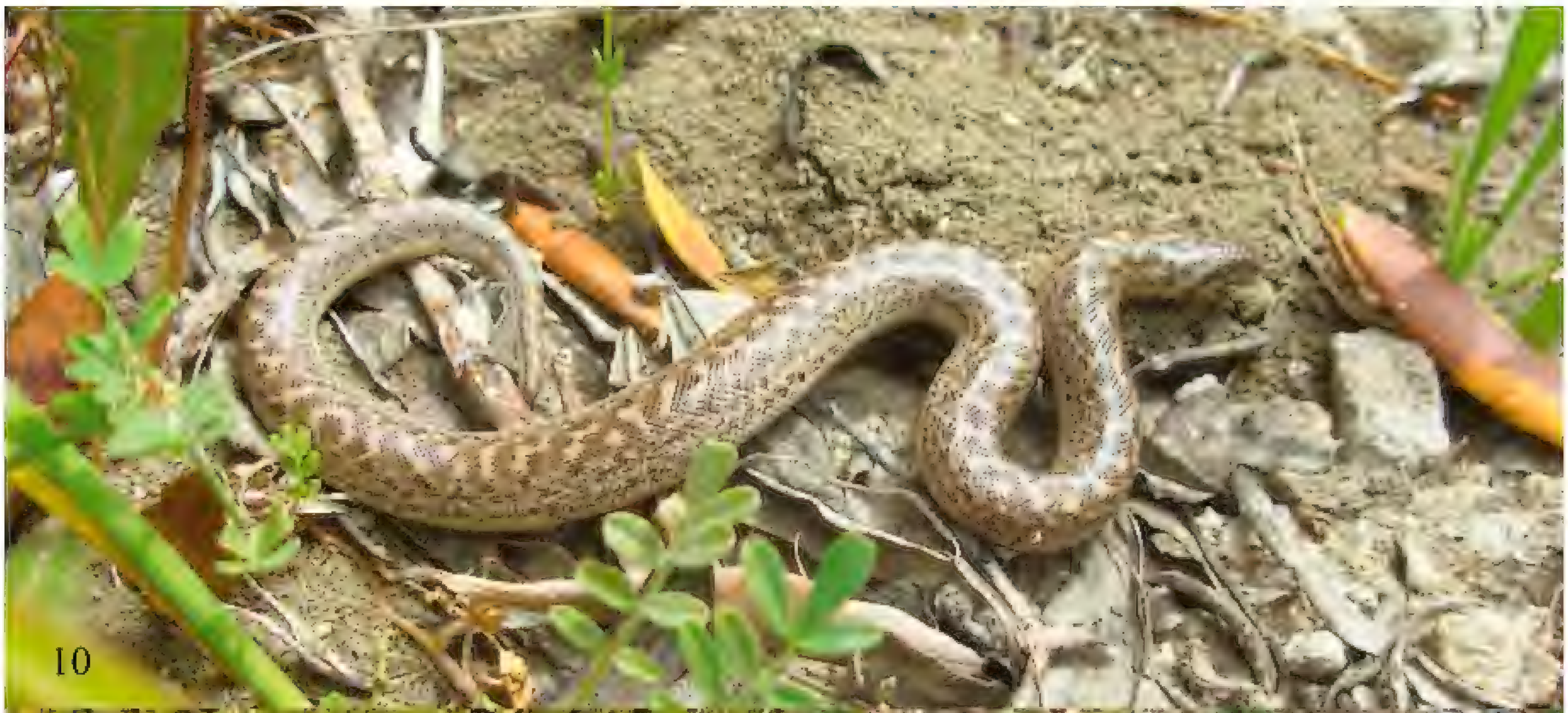
The coin snake, *Hemorrhois nummifer* (Reuss, 1834) (ζαμενής της Ρόδου), in the Dodecanese Archipelago is found on Patmos, Lipsi, Leros, Kalymnos, Kos, Symi, Rhodes and Kastellorizo. This snake has a colouring that resembles that of *Montivipera xanthina*, with which it shares a good part of its range (Aegean-Anatolian distribution). Certainly, its aesthetic similarity to the viper deters predators and increases the snake's fitness (Schätti & Agasian, 1985).

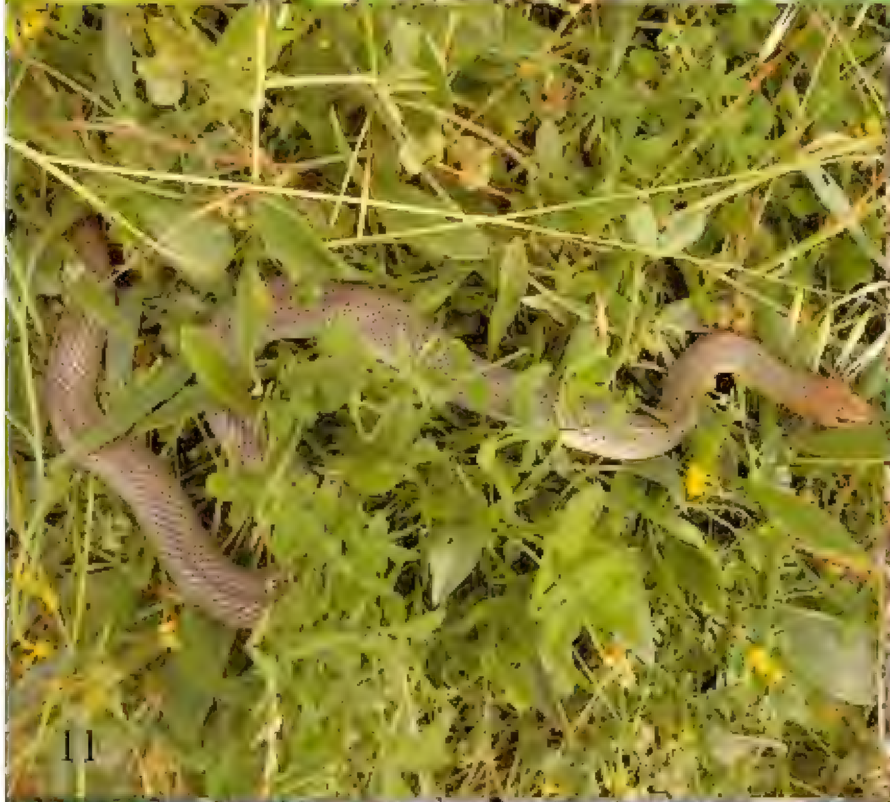
The Dahl's whip snake, *Platyceps najadum* (Eichwald, 1831) (σαΐτα), is a very slender snake. It has been observed on Arki, Patmos, Lipsi, Leros, Kalymnos, Kos, Nisyros and Rhodes. The population of Kalymnos Island exhibits a particular polymorphism (a dark phenotype and a dark olive-grey one) that in the past led to its allocation to the subsp. *kalymnensis* (Schneider, 1979) (Cattaneo, 2005a). The Rhodes population seems to belong to the nominate form (adults with iron-grey colour). On all the other Dodecanese Islands, the subsp. *dahlii* (Schinz, 1833) is present.

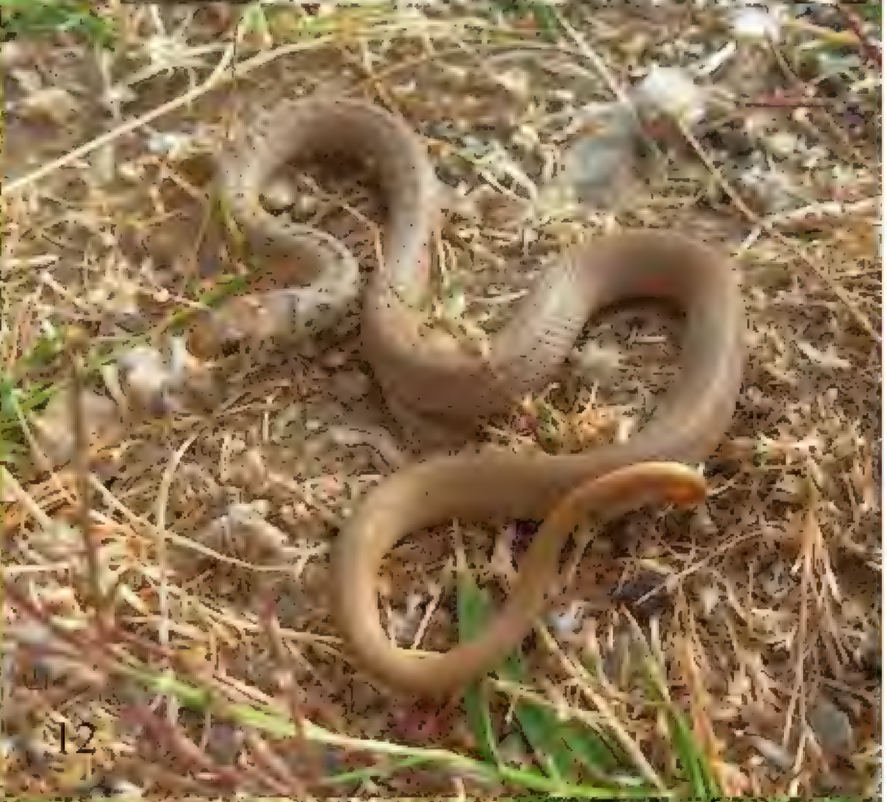
The cat snake, *Telescopus fallax* (Fleischmann, 1831) (αγιόφιδο), is a common species that is not so easily observable as it is active during the night. It is found on Lipsi, Kalymnos, Kos, Pserimos, Tilos, Symi, Rhodes, Karpathos, Kasos and Armathia. On Rhodes, Tilos, Kasos and perhaps on Symi and Armathia, there is the endemic subsp. *rhodicus* Wettstein, 1952, characterized, among other things, by its dull and low-contrast colours, a probable expression of its adaptation to dry environments (Grano et al., 2018).

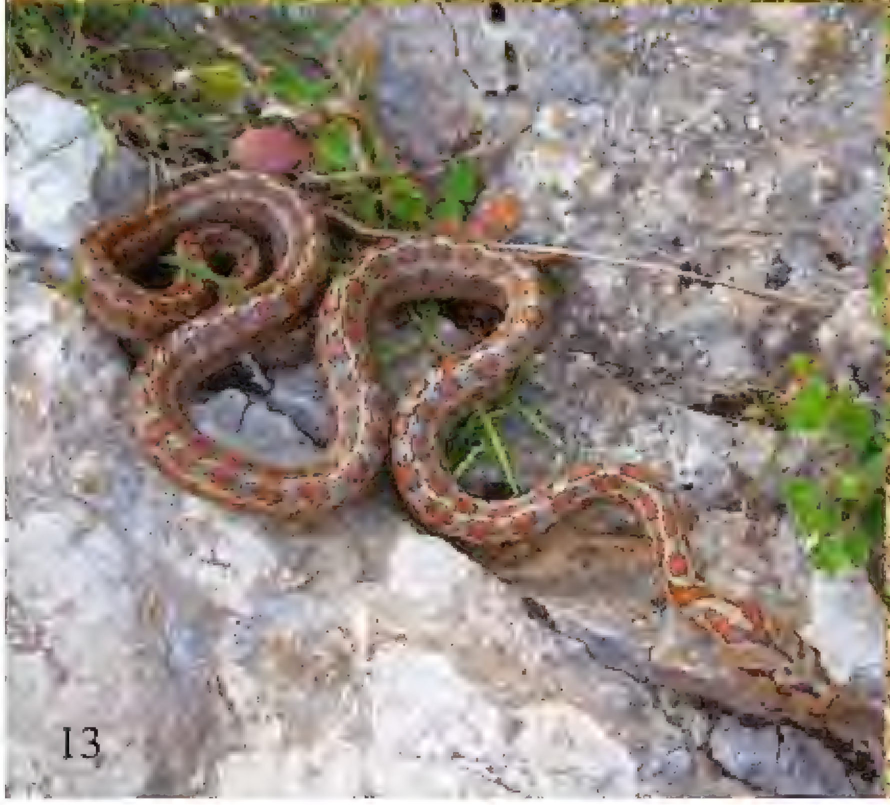
The leopard snake, *Zamenis situla* (Linnaeus, 1758) (σπιτόφιδο) (Fig. 13), is the most beautiful European snake. In the Dodecanese Archipelago it has been reported on Kos, Rhodes and Chalki (Grano & Cattaneo, 2015). There are two morphs for this species: one spotted (phenotype *leopardinus*) and the other striped (phenotype *situla*); even though they can be found together on the same island, the first seems to be more common on Rhodes and Chalki, and the latter on Kos (Zavattari, 1929).

In the Dodecanese both of the water snakes found in Greece have also been reported. The grass snake, *Natrix natrix* (Linnaeus, 1758) (νερόφιδο), is a very common species in Europe and Asia Minor. Its habitat is close to wetlands and, especially in Rhodes, it can be found next to rivers and streams. It has also been reported on Leros, Kos and Karpathos. On these islands, the species is repre-









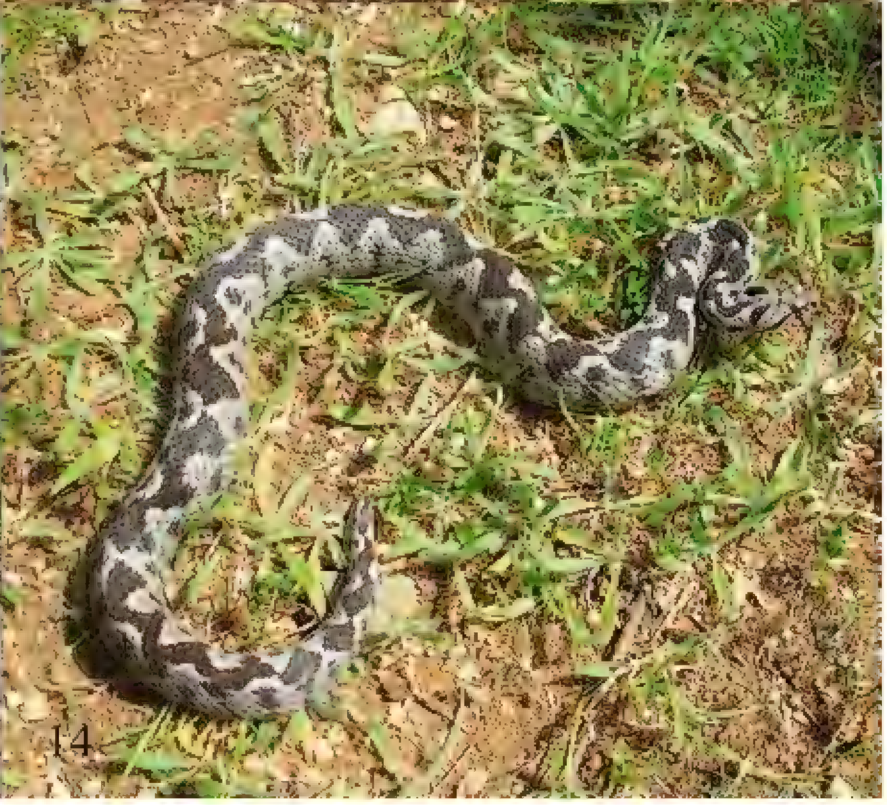


Figure 10. *Eryx jaculus* (Leros island). Figure 11. *Dolicophis caspius* (Patmos island). Figure 12. *Eirenis modestus* (Symi island). Figure 13. *Zamenis situla* (Chalki island). Figure 14. *Montivipera xanthina* (Symi island).

sented by the subsp. *persa* (Pallas, 1814), also characterized by two clearly marked stripes along the back, with the exception of the specimens from Karpathos which lack stripes (Bogaerts et al., 2018). A dead specimen of *N. natrix* on the island of Kasos has been found from the authors in August 2019 (Grano & Cattaneo, 2020). The specimen lacked of longitudinal stripes, resembling the phenotype of the specimens found in Karpathos.

On Rhodes, the dice snake *Natrix tessellata* (Laurenti, 1768) (λιμνόφιδο), more adapted to "aquatic" life, can also be found. Where these two species of *Natrix* coexist, their complementary diets make them ecologically compatible: *N. natrix* mainly looks for batrachians while *N. tessellata* mostly for fish. The current presence, however, of *N. tessellata* on Rhodes needs to be confirmed.

The eastern montpellier snake, *Malpolon insignitus* (Geoffroy Saint-Hilaire, 1827) (σαπίτης), is a common large snake. It is found on Kalymnos (Broggi, 1997), Kos and Kastellorizo. On these islands, the species is represented by the subsp. *fuscus* (Fleischmann, 1831), which is smaller in size compared to the westernmost forms of the genus *Malpolon*. It is worth noting that in nature, even at an adequate distance for observation, this snake could be easily confused with *Dolichophis caspius*, especially if young or sub-adult.

The Ottoman viper or coastal viper, *Montivipera xanthina* (Gray, 1849) (οθωμανική οχιά) (Fig. 14), is the only snake that could pose a danger to man due to its potent venom. In general, however, vipers do not bite unless they feel threatened or disturbed. This viper species is present on mainland Greece, such as in Rhodope and Evros (Cattaneo, 2017), and on some islands of the Eastern Aegean like in the Dodecanese Archipelago. More specifically, it has been reported on Patmos, Lipsi, Leros, Kalymnos, Kos and Symi. A young specimen was also detected on Tilos Island (Broggi, 2006). Along the eastern Aegean arc, the species shows great variability (Cattaneo, 2014): on Chios the subsp. *nilsoni* Cattaneo, 2014, is larger in size; on Leros the subspecies *dianae* Cattaneo, 2014, is present and characterized, among other things, by its larger body circumference. Furthermore, on Lipsi, a particular morphotype with exceptional features has also been detected (Cattaneo, 2018).

	AG	AR	PM	LS	LR	KL	PS	KO	NS	SY	SK	TL	RD	CH	AL	KP	KS	AM	KT
Xerotyphlos vermicularis			X		X	X		X		X			X						
Eryx jaculus					X	X		X											
Dolichophis caspius	X		X			X		X	X							X			
Dolichophis jugularis					X			X		X	(X)	X	X	X	(X)				X
Eirenis modestus					X	X				X	X								X
Hemorrhois nummifer			X	X	X	X		X		X			X						X
Platyceps najadum		X	X	X	X	X		X	X				X						
Telescopus fallax				X		X	X	X		X		X	X			(X)	X	X	
Zamenis situla								X					X	X					
Natrix natrix					X			X					X			X	X		
Natrix tessellata													(X)						
Malpolon insignitus						X		X											X
Montivipera xanthina			X	X	X	X		X		X		(X)							

Table 2. The snakes of the Dodecanese Archipelago (the brackets indicate "presence to be confirmed"). Legend: AG = Agathonisi; AR = Arki; PM = Patmos; LS = Lipsi; LR = Leros; KL = Kalymnos; PS = Pserimos; KO = Kos; NS = Nisyros; SY = Symi; SK = Seskli; TL = Tilos; RD = Rodi; CH = Chalki; AL = Alimia; KP = Karpathos; KS = Kasos; AM = Armathia; KT = Kastellorizo.

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APPENDIX

The large whip snake of the Rhodes Archipelago, *Dolichophis jugularis zinneri* Cattaneo, 2012

Augusto Cattaneo

Dolichophis jugularis known formerly mostly as *Zamenis gemonesis*, so named, e.g., by Bedriaga (1882), Boettger (1888), Calabresi (1923), was known, until recent years, as *Coluber jugularis* Linnaeus, 1758.

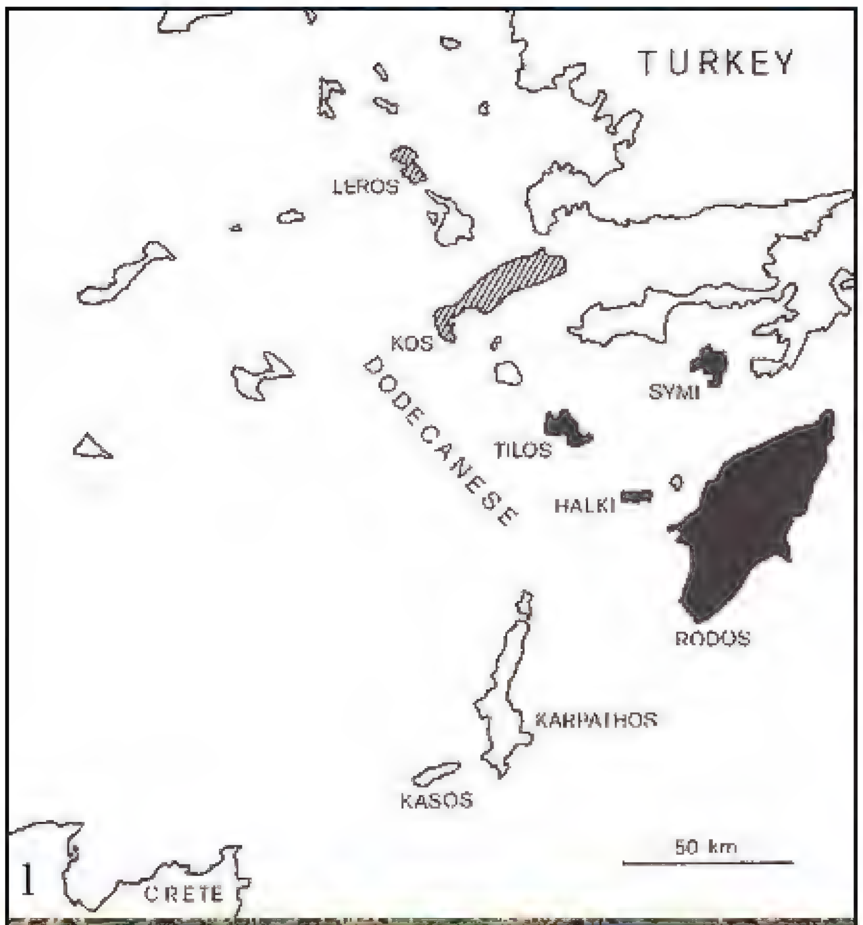
This large snake, which can normally exceed two meters in length and 1500 grams in weight, shows a distribution along the Turkish coast in the southeastern Aegean Islands of Leros, Kos, Rhodes, Symi, Chalki, Tilos, Kastellorizo and conceivably Alimia and Seskli. Moreover, it has also been found on Cyprus and in the Near and Middle East.

Currently, *D. jugularis* is regarded as a polytypic species, represented by four subspecies: *D. jugularis jugularis* (Linnaeus, 1758) from SW Turkey and the opposite islands of Leros and Kos, eastern Caucasus, northern Iraq and Iran, central and northern Syria) (Fig. 1), *D. jugularis asianus* (Boettger, 1880) from southern Syria, Jordan, Lebanon, Israel, and the Sinai Peninsula in Egypt, *D. jugularis cypriacus* (Zinner, 1972) from Cyprus, and *D. jugularis zinneri* Cattaneo, 2012 from Aegean islands of Rhodes, Symi, Chalki and Tilos (Fig. 1).

Dolichophis jugularis populations inhabiting the Dodecanese Archipelago (Rhodes, Symi, Chalki and Tilos) have always aroused great interest in the herpetologists who have studied them (Wettstein, 1953; Clark, 1992; Bader & Riegler, 2004; Bader et al., 2009). Indeed, their morphological features, especially those concerning the colouring, differ from those of the neighboring continental populations and northern Dodecanese (Leros, Kos). In this regard, Clark (1990) writes: "*On Tilos the snakes are quite different. Those caught, all males, were very nearly black above but the colouring was a dull mat instead of shiny ... The bellies were green/yellow powdered or marked with black ... I postulate that in view of the presence of* C. j. jugularis *on Karpathos the Tilos populations represent an intermediate form between the two subspecies* [back then *Dolichophis caspius* was regarded as a subspecies of *D. jugularis*, ed.s n.]". Furthermore, while Wilson & Grillitsch (2009) point out that the populations of Rhodes and Symi are homogeneous in their morphological characteristics, Schlüter (2010) argues: "*Die Symi-Population scheint eine Position zwischen* D. caspius *und* D. jugularis *einzunehmen. Daher bestehen Probleme bei der taxonomischen Zuordnung. Vielleicht handelt es sich um eine eigene Unterart oder gar kryptische Art*".

The features of the Rhodian populations were noted by Zinner (1972), who thought he could describe them with a new subspecies, which he improperly attributed to *D. caspius*. Indeed, in his dissertation, though never published, the *Dolichophis* specimens appear under the name *Coluber caspius eiselti* and are described as follows: black back; upper surface of the head splotchy or spotted; the underside orange to brick-red with black dots from the throat to the subcaudal region; 189–197 ventrals. From a nomenclatural point of view, the description of Zinner (1972) is not valid (Ščerbak & Böhme, 1993).

Actually, *D. jugularis* populations inhabiting the Rhodes Archipelago have acquired morpho-physiological and behavioral features that bring them closer to their sister species *D. caspius*, so much so that it has led, as is the case here, to identification mistakes. Indeed, these specimens have less intense colouring perhaps in response to drier environments, and are more aggressive than the nominate form. Not only that, but they seem to seek the same kind of environments (moist depression in the soil) as *D. caspius* as well as practice the same by sight hunting habits and straight line escape technique, all behaviors also detected by Zinner (1972). At this point it is no wonder that Zinner (1972) ascribed the Rhodian population of *Dolichophis* to *caspius* instead of *jugularis*.



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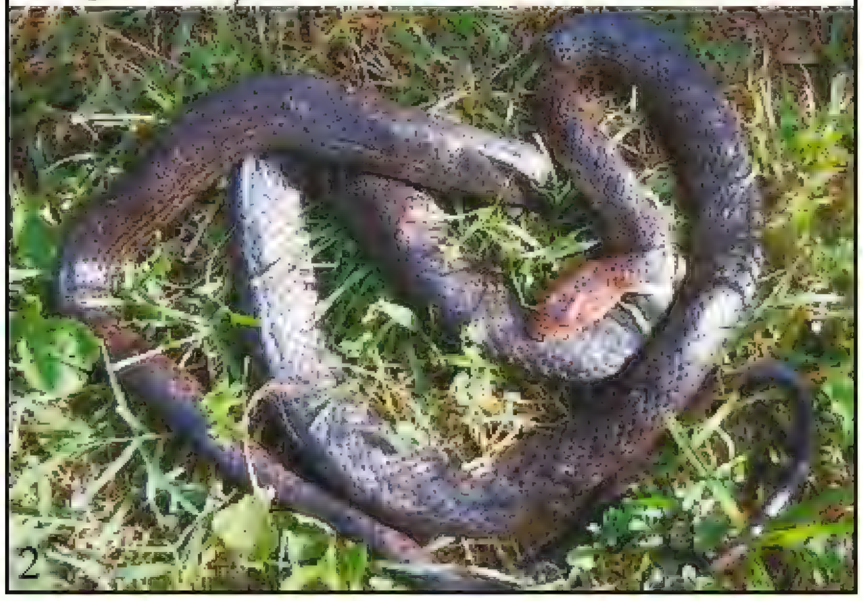

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Figure 1. Aegean range of *Dolichophis jugularis*. The distribution of the nominate form is shown in dotted lines, that of the ssp. *zinneri* in black. Figure 2. Male adult specimen of *D. jugularis zinneri* from Tilos Island.

All of these observations and considerations have led to the description of a new geographical subspecies, endemic of Rhodes and of its Archipelago: *Dolichophis jugularis zinneri* (Cattaneo, 2012), so named in honour of Dr. Hermann Zinner, who though ascribing it to another species, was the first to highlight the specific nature of the Rhodian populations of *D. jugularis*.

The morphological characteristics of the new taxon are summarized below. *Dolichophis jugularis zinneri* differs from the typical form in that it has a wider head with shorter and pointed muzzle (cephalic index: max length/width of the head, is less then 2, while it is more than 2 in *D. jugularis jugularis*), and in the colour the supralabials, the sides of the neck and the throat are always yellow (instead of salmon-red) and it has a less intense dark dorsal colour (the basic colour darkens anterior-posteriorly). Also characteristic are: the high occurrence of yellow-bellied phenotypes (the nominate subspecies normally has a red belly), the lower number of ventrals (generally less than 200), and the persistence of the juvenile habitus over 100 cm of total length. The ventral colour (red or yellow, never black) also helps to distinguish *D. jugularis zinneri* from both *D. jugularis asianus* and *D. jugularis cypriacus*.

All of these features in the population of Tilos are more widespread and emphasized, perhaps in relation to the more pronounced isolation conditions than those of the other conspecific neighboring populations (Fig. 2) (Cattaneo, 2009).

The holotype, an adult male specimen collected on Rhodes in the locality of "Laerma" on May 2015, is currently part of the Herpetological Collection of the Alexander Koenig Museum in Bonn, Germany.

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Contribution to the knowledge of beetles (Insecta Coleoptera) of some protected areas of Apulia, Basilicata and Calabria (Italy)

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ABSTRACT The lists of Coleoptera published by the author between 1986 and 1996 concerning the following protected areas from southern Italy are updated: Gargano Promontory, Policoro Wood, Pantano Lake of Pignola, Pollino Massif and Sila Plateau. Data is integrated with subsequent collections of the writer and with bibliographic citations of other authors. With the same criteria the species of further three areas are also listed: Mount Vulture-Monticchio Lakes, Central Lucan Apennines and Aspromonte. A total of 5,130 taxa were recorded for the eight surveyed National or Regional Parks, which are located in Apulia, Basilicata and Calabria regions (Italy). Of these species, 472 are endemic to the Italian territory. The saproxylic species amount to 1,115, their related IUCN category is referred to and an interpretation of the emerging data is suggested. A chronology of the entomological researches carried out in the past has been reconstructed, moreover description of main features and geographical boundaries of the treated sites are provided. All taxa subject of this study are listed in taxonomic order with indication of the areas where their presence occurs and specifying the data source. The total number of species for each family is evaluated area by area and the data on the most representative of Coleoptera families are briefly commented, with remarks on the current state of research.

KEY WORDS Biodiversity; Coleoptera; National Parks; southern Italy; species.

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INTRODUCTION

The realization of this work stems from the need to update, in the taxonomy and nomenclature, several catalogues on southern Italy Coleoptera published by the author in the decade 1986-1996: Coleotterofauna del Massiccio del Pollino (Angelini, 1986), Coleotterofauna del bosco di Policoro (Angelini & Montemurro, 1986), Coleotterofauna del Promontorio del Gargano (Angelini, 1987), Coleotterofauna dell'Altopiano della Sila (Angelini, 1991) and Coleotterofauna della Riserva Naturale WWF Lago Pantano di Pignola (Angelini, 1996).

The research carried out in the following years by the author has besides produced a significant amount of unpublished data, which here go to integrate those previously published. Likewise, to offer an overview as accurate and complete as possible of the current state of knowledge on the Coleoptera in these areas, all the species and data reported by other authors in the vast bibliography (annexed) have been added.

It has been decided to expand the portion of territory examined in the previous catalogues to include the Park of the Mount Vulture-Monticchio Lakes, the Central Lucan Apennines and the Aspromonte since for these areas the amount of data collected over the years is significant and at the same time there is a body of literature that dates back to the first entomological explorations of Southern Italy, going back to the last quarter of XVIII century. Map of figure 1 shows the general location of all the study areas.

For the Gargano Promontory, data from Holdhaus (1911), previously excluded by Angelini (1987), are also included.

It is necessary to present the unpublished or bibliographic data in the form of a table rather than provide a full list with accurate information on the collection localities since this solution, although more appropriate, would require a remarkably more voluminous contribution; a similar update is underway, with comprehensive detail of all the localities, bibliographic references and status changes that have occurred over time, to be published exclusively online.

The coleopterological researches in Apulia, Basilicata and Calabria

The extreme south of Italy is a reservoir of great biodiversity and of a fauna with a rather different composition than the rest of the Peninsula. Entomologically, this territory suffered greatly during the 19th century due to the substantial lack of naturalists native to these regions and for the difficulty of connections by land (Salfi, 1963: 4) because of the local wilderness; it is not a coincidence that the history that will be exposed is clearly different from that of neighboring Sicily (Romano, 2006).

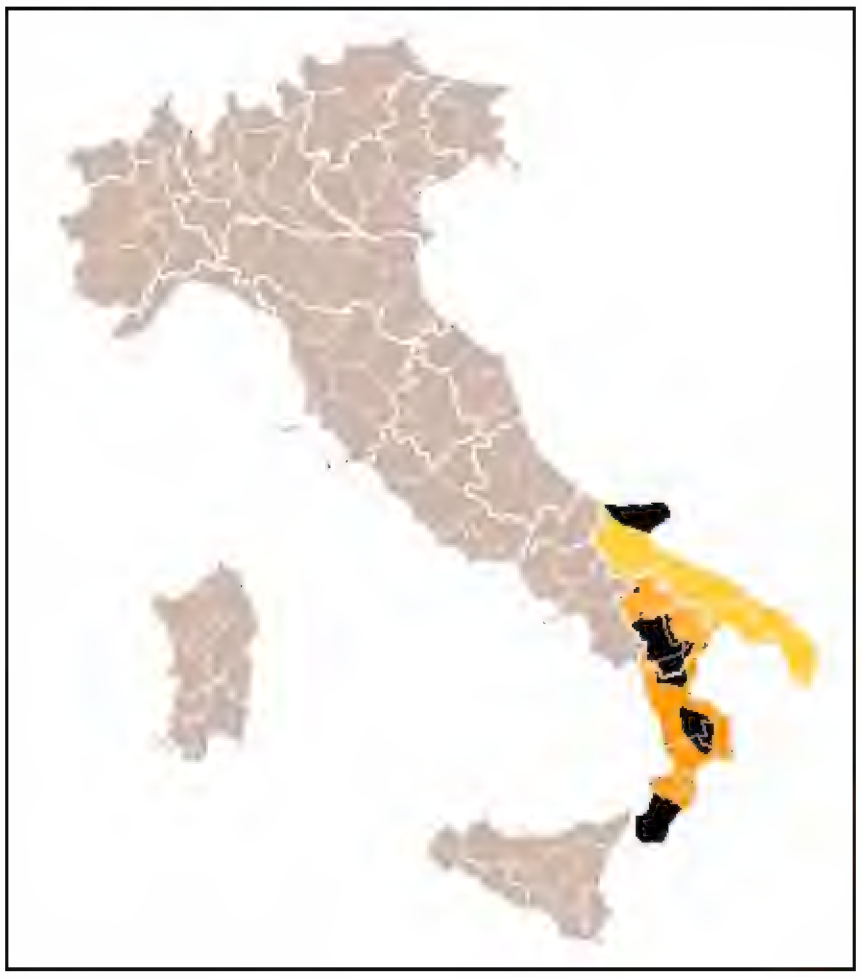

Figure 1. Study areas: in black, the location of the eight sites in southern Italy covered by this study.

Only in the 20th century, studies on entomofauna have become more systematic, sometimes promoted by Italian universities and museums to acquire valuable study material.

A substantial contribution came from the author's personal researches, being himself favored by residing in Apulia and thus being able to more easily and frequently explore the target regions of this work, and from the many colleagues and friends entomologists with whom he shared fruitful hikes over the years.

The following is a chronicle of the explorations that involved these areas.

1783. The earlier research of which we know about in southern Italy are conducted in Aspromonte (Calabria ulteriore) in 1783 by Giulio Candida and Giuseppe Stefanelli and published by Vincenzo Petagna (1787), which lists 239 species of collected insects. It should be emphasized that this publication was a great success at the time so that the first print, which took place in 1786 and has not been possible to obtain, was followed by others including that of 1787 mentioned in the bibliography and most frequently cited.

1826. Luigi Petagna, Giovanni Terrone and Michele Tenore from 3 to 16 July make a botanical expedition from Naples to Cosenza, visit Monte Sirino and Pollino and mention 4 species of Coleoptera.

1827. Oronzo Gabriele Costa visits the Aspromonte together with Giovanni Gussone in the month of July (Costa A., 1863) and the list of vertebrates and arthropods they found is published 12 years later (Costa O.G., 1839), although the related report is read at the Royal Academy of Sciences the following year.

1851. Christian Suffrian (1851: 79) describes *Chrysolina interstincta* based on two specimens coming respectively from Sicily and Calabria and collected by Ludwig Parreyss (Daccordi & Ruffo, 2005: 121, teste Bourdonné); no other data was found concerning the research carried out by Parreyss in Calabria.

1859. Achille Costa visits Sila and Aspromonte (Costa A., 1881: 1). Four years later he publishes the data about Aspromonte (Costa A., 1863) listing 577 Coleoptera species, which include those previously mentioned by Petagna (1787).

1870–1875. Giovanni Battista Adami, A. Steffanini, Filippo Fanzago, Guelfo Cavanna and L. Panato presumably perform entomological research in Calabria in these years and a first list (devoid of collecting sites) of 300 species of Coleoptera is published by Bertolini (1876).

1876. Achille Costa from July 11th to September 12th of 1876 visits Sila, the surroundings of Tiriolo and Cirò and makes known the results of his research five years later (Costa A., 1881: 45–51).

1876. Guelfo Cavanna and other naturalists visit the Aspromonte in the months of May and June and their material is studied by various specialists, but the results are not divulged.

1878. Flaminio Baudi di Selve conducts researches in Calabria: *Omoglymmius germari* (Ganglbauer, 1891) in Mazzei et al. (2019).

1880. Antonio Biondi, Cesare Caroti and Guelfo Cavanna between the 8th and 16th of July 1880 carry out research in Rionero and Mount Vulture and between 24th and 28th of July the same year on Pollino. The results are released by various specialists and the whole list of collected Coleoptera is published by Baudi, Piccioli & Cavanna (1882). Cavanna (1882) also publishes a detailed report about this mission.

1881. (April), 1883 (September), 1884 (May), 1887 (August) Andrea Fiori is in Calabria (in 1884 and 1887 with Flaminio Baudi di Selve); dates of the last three trips are taken from one of his works (Fiori, 1894: 87); many data are disclosed in various papers both by Fiori and Baudi. Most of the citations found in Luigioni (1929) sub “Cal” are taken from these research, and secondarily from the publications mentioned above and a few others that follow.

1887. Andrea Fiori in August visits Sila (Fiori, 1894) and Gargano (Fiori, 1914b); only some of the data are made known in scattered works.

1896. Achille Costa visits Pollino Massif (Salfi, 1963: 19 and Ruffo & Vigna Taglianti, 1988: 13) but does not publish the relevant data.

1905. Gustav Paganetti-Hummler visits Aspromonte for a long time; from one of his papers (Paganetti-Hummler, 1910) can be deduced that he collected in the following periods and localities: April-May in Gerace, Antonimina and Ciminà, from May to the beginning of August in Santa Cristina, Sant’Eufemia and Aspromonte. It is known that a manuscript exists which lists, with collecting localities, the species found in Aspromonte by Paganetti-Hummler (Magistretti, 1960: 111), but unfortunately it was not possible to trace it.

1906. Giacomo Cecconi visits Tremiti Islands between 15 and 25 of February and from 25 of May for a few days. The material collected is published by him two years later (Cecconi, 1908).

1906–1907. Karl Holdhaus visits Gargano from 10 to 30 of May in 1906 accompanied by Hamilkar Stolz and later from 3 to 18 April 1907 together with Alfred Kniž and Moritz Hilf. The latter stayed until the 20th of June to collect Coleoptera on behalf of Otto Leonhard. The results of these researches are published four years later (Holdhaus, 1911).

1909 and 1910. Alfredo Andreini carries out long researches in Basilicata in the surroundings of Latronico and Maratea; from examination of his finds, mentioned in many publications as well as from the direct study of specimens he collected and are now kept in the Dodero collection at Genoa (Poggi i.l.), it is possible to establish that he stayed there from April 21 to September 20 of 1909; instead for the year 1910 the timespan of its permanence is not possible to ascertain.

1911, 1912 and 1913. Andrea Fiori visits Mount Vulture in the month of May 1911 (Ruffo & Vigna Taglianti, 1988: 15). From 15th of April to 4th of June 1912 he makes researches in Calabria and Sicily (Fiori 1915a and 1915b). In 1913 he goes on Gargano (Fiori, 1914b, 1915a). Only a few individual findings are published in the above mentioned works.

1913. Adolfo Falzoni explores Sila in the month of June (Fiori, 1914a: 18).

1921. Andrea Fiori in August visits Sila: *Clinidium canaliculatum* (O.G. Costa, 1839) in Mazzei et al., 2019).

1923. Giuseppe Müller visits Mount Vulture (Ruffo & Vigna Taglianti, 1988: 15).

1925. Arturo Schatzmayr visits Mount Vulture in May (Schatzmayr, 1926: 145, sub *Oedemera subulata* Olivier, 1790 = *Oedemera pthysica* (Scopoli, 1763).

1926. Jaroslav Štorkán searches the Gargano in June. A list of species not previously mentioned by Holdhaus (1911) is published by Roubal (1932).

1933. An examination of Zombori's work (1984) shows that Agostino Dodero collected beetles in Sila at Camigliatello from 27 May to 23 August 1933; further data related to Cosenza and San Pietro in Guarano are deduced from the publications of Poggi (2009) and Liberti & Poggi (2018). Reference to his findings is also present in papers by other authors.

1933. Arturo Schatzmayr and Carl Koch visit Pollino in July (Tassi, 1966a: 1 and Magistretti 1955: 1); only three contributions are published on this mission (Koch, 1933a, Koch, 1933b and Wittmer, 1935).

1934, 1937 and 1940. Alessandro Ghigi explores Gargano in August 1934, then in 1937 (unknown period) and again, together with Francesco Pio Pomini, in the second half of April. Between the end of May and 5 June 1940 both of them, besides Gargano, also visit the Tremiti Islands. The results are published by Gridelli (1949b).

1939. Lars Brundin & Thure Palm visit Pollino in June and in a short note several species of Coleoptera are reported (Palm, 1939). The Curculionidae collected in this expedition are treated by Magnano (1957a), and Cerambycidae by Tassi (1966a).Various data are disclosed in works by other authors, including the description of some new species (Nyholm, 1948).

1939. Edgardo Moltoni from June 25 to July 14 collects in Sila and results are published by Schatzmayr (1941 and 1943).

1941–1945. Alessandro Focarile in July 1941 and, with Giovanni Mariani, in April 1942 is on Mount Vulture; between 5 September 1943 and 10 April 1945 he carries out research in various places in Apulia and Basilicata including Mount Vulture and Pollino Massif (Focarile, 1959: 18). The results of these researches were only published in small part by different authors.

1948. Giovanni Binaghi visits Gargano in the spring; only a few of these data are published (Binaghi, 1948).

1948, 1949, 1950 and 1957. Sandro Ruffo, Edoardo Gridelli, Antonio Giordani Soika, Mario Magistretti and Angelo Pasa go to Gargano, Tremiti Islands, Murge and Salento as part of a research on Apulian fauna promoted by Umberto D'Ancona of the Institute of Adriatic Studies (Gridelli, 1949b: 148; Magistretti, 1966: 8 and Ruffo & Vigna Taglianti, 1988: 21). The results are published by Gridelli (1949a, 1949b and 1950), by Ruffo (1955) as well as by about fifteen Italian and foreign specialists in the journal "Memorie di Biogeografia Adriatica" (1950–1962) (Ruffo & Vigna Taglianti, 1988: 21).

1950. Giovanni Binaghi in May is in Sila and in Aspromonte, only some data is published in various works.

1950, 1951 and 1953. Marcello La Greca, Michele Sarà and R. Capaldo (7 July–10 August 1950), Sandro Ruffo, Angelo Pasa and Livio Tamanini (10–23 June 1951 and 12–24 June 1953) carry out a series of research campaigns on Pollino promoted by Naples University. The results are published between 1950 and 1966 in thirty-two memoirs (Salfi, 1951; Ruffo & Vigna Taglianti, 1988: 21) seventeen of which dedicated to Coleoptera.

1955. Guido Grandi promotes a research campaign for the Institute of Entomology of Bologna University at the Umbra Forest (Gargano). Searches begin on July the 4th and last for about one month; in addition to Grandi himself, Maria Matilde Principi, Giorgio Fiori, Egidio Mellini and Dante Faggioli also take part. The first results are published by Faggioli (1955); the researches conducted are illustrated by Grandi (1956).

1955. Marcello La Greca visits the Tremiti Islands as part of a research project promoted by the Institute of Zoology and Comparative Anatomy of Bari University.

1956–1958. Alessandro Focarile and Giovanni Mariani in these years undertake coleopterological research in 23 sites along the Ionian shorelines of Apulia, Basilicata and Calabria; they do sampling in Policoro Wood on May 27–29 of 1956, June 9 of

1957 and May 24 of 1958. The outcomes of these researches are illustrated in a series of eighteen works released between 1959 and 1979.

1957, 1958, 1963 and 1966. As part of a research project on Apennine fauna promoted by the Civic Museum of Natural History of Verona and coordinated by Sandro Ruffo (started in 1954 with a mission on the Sibillini Mountains), in Aspromonte six expeditions made up of a total of nine members are performed: in May and July 1957, June and August 1958, August 1963, October 1966 (Magistretti & Ruffo, 1969: 388). The results for 16 families are illustrated in eight papers.

1957. Anna and Mario Magistretti, Angelo Pasa, Sandro Ruffo and Livio Tamanini visit Policoro Wood in May (Magistretti & Ruffo, 1969: 387); individual data are published in many papers.

1960. Anna and Mario Magistretti, Angelo Pasa, Sandro Ruffo and Livio Tamanini visit Mount Vulture and the Monticchio Lakes in June (Magistretti & Ruffo, 1969: 387); only single data are published in several works.

1960. Some Roman entomologists, stimulated by Frederick Hartig, go exploring Mount Vulture (Ruffo & Vigna Taglianti, 1988: 15).

1960, 1961, 1962 and 1967. As part of the research on Apennine fauna promoted by the Civic Museum of Natural History of Verona, five missions carried out by a total of seven members visit Sila, the Coastal Chain and Serre Calabre: in June and August 1960, August 1961, August 1962, July 1967 (Magistretti & Ruffo, 1969: 388). The results concerning 12 families of Coleoptera are published in five papers.

1960, 1961, 1962 and 1963. Giorgio Marcuzzi conducts his research in Apulia (comprehensive of Gargano and the Tremiti islands, including Pianosa) and in Basilicata's province of Matera. The results are shown in the works of Marcuzzi (1962) and Marcuzzi & Lafisca Turchetto (1977).

1961. Walter Liebmann visits Aspromonte (Magnano, 1964: 107) but the results do not appear to have been published.

1962. Giovanni Sichel and his colleagues go to Aspromonte (Tassi, 1966: 622) but the outcome of their research is not known.

1963, 1964 and 1967. As part of the research on Apennine fauna promoted by the Civic Museum of Natural History of Verona, four missions composed by a total of five members visit Apulia (Gargano, Murge, Terra d'Otranto) and Basilicata (Matera): in September 1963, June 1964, May and September 1967. Results are partially published in many papers. Just Magistretti (1966) releases data about Carabidae on the basis of all the specimens collected in Apulia in the overall expedition period.

1963. Gunnar Dahlgren from June 27th to July 7th visits Lorica in Sila by himself (from June 9th to June 26th he explores other Calabrian sites: Paola, Rogliano, Cosenza and Castigione) and the results are published (Dahlgren, 1964).

1964. A series of researches on the Central Lucan Apennines, Mount Vulture, Pollino and Policoro is begun by numerous members of the Roman Association of Entomology (Fabio and Mario Cassola, Franco Tassi, Silvio Bruno, Vincenzo Vomero, Gianni Gobbi, Giuseppe Maria Carpaneto, Franco Marozzini, Mario and Giuseppe Pinzari, Francesco Sacco, Paolo Marcello Brignoli, Walter Rossi, Paolo Audisio, Enzo Colonnelli) (Gobbi, 1971a: 28) but only a small part of the enormous amount of data collected is published (Gobbi, 1971a, 1973a, 2018; Colonnelli, 1974a; Gobbi & Piattella, 2008).

1965, 1968, 1970 e 1972. Giovanni Binaghi, Italo Bucciarelli, Alessandro Focarile, Giovanni Mariani, Giuseppe Meggiolaro and Carlalberto Ravizza visit Mount Sirino in the Central Lucan Apennines; only a contribution on the Carabids is presented by Ravizza (1973) as a whole, while the remaining data are individually published in scattered works.

1965–1967. Michele Sarà and Giovanni Salamanna make a series of explorations of the Tremiti Islands in the context of a research on island populations promoted and financed by the National Research Council, in this specific case entrusted to the Institute of Zoology and Comparative Anatomy of Bari University. Data regarding Scarabaeidae family are published by Salamanna (1968).

1968–1976. Helio Pierotti visits Pollino, Sila and Aspromonte on several occasions and announces the results regarding genus *Aphodius* in 1977. Between 1969 and 1973 even Giovanni Dellacasa repeatedly goes to Sila and Aspromonte and the author's results are included in Pierotti's work (1977).

1968. In the month of July the author's personal searches in southern Italy begin, assiduously lasting for over 40 years for periods varying from 1 to over 20 days. The results of this research have been published only very partially in a series of twenty-eight works, some of which are dedicated to specific areas: Policoro (1986, with F. Montemurro), Pollino (1986), Gargano (1987), Sila (1991), Lago Pantano di Pignola (1996), light traps in Laghi Pantano di Pignola and San Giuliano (1998); other data were recorded in works dedicated to specific families: Hydradephaga (1972–1984), Hydrophilidae (1973 and 1974 with G. Ferro), Ptiliidae (1997, with M. Sörensson), Carabidae (1997, with V. Monzini), Curculionoidea (1997, with R. Caldara), Latridiidae (1999, with W. Rücker), Leiodinae (1985-1995), Cryptophagidae (1981, 1984 and 1996 with J.C. Otero), Malachinii (2001, with C. Pasqual), Phalacridae (1995, with Z. Švec) and Pselaphinae (2001, with G. Sabella). More than 500,000 specimens were collected overall, all studied by specialists (except for several Staphylinidae, Ptiliidae, Nitidulidae, Scydmaeninae, Mordellidae, Scraptidae, Bruchinae, Phalacridae, Corylophidae, Alexidae) and belonging to over 4,500 species. Data also appear in publications of many other authors, including descriptions of about one hundred new species.

1973. As part of the Verona Museum's Programs, Roberto Pace undertakes a series of research in Central southern Apennines and visits in particular Gargano, Pollino Massif, Orsomarso Mountains, Serre Calabre, Sambiase and Aspromonte. He describes many hypogeous new species in a total of thirteen publications (1974b–2002).

It is deemed of no use to report the researches undertaken after the 1970s, when connections became easier and many were the entomologists who visited the southern regions. Related data are dispersed in an endless series of works (well over 300, with descriptions of more than 140 endemic species) while there are no coordinated research campaigns with overall publication of the data.

From the late 1980s to date, Pietro Brandmayr and his collaborators have been a reference point for entomological research mainly in Sila, but also in other territories from Aspromonte to Pollino. Their research, though essentially aimed at ecological studies, in particular about Carabidae used as environmental indicators, has not left out the other Coleoptera families, especially the saproxylic beetles. With their results they have produced dozens of works, both of divulgative and scientific nature, also including descriptions of new species.

MATERIAL AND METHODS

Study areas

Only in the last thirty years the eight areas covered by this study have been gradually placed under special protection through the establishment of several National and Regional Parks. Entomological research, on the other hand, as described above, has a much longer history and the writer himself has done most of his research before such protected areas were created.

It is not always easy to give an interpretation of the borders that entomologists, especially in the past, have attributed to these area. Their specimens were often labeled only with generic toponyms such as "Gargano", "Sila", "Aspromonte", etc., and usually the meaning was in a geographical sense, the one marked by natural boundaries. We must nevertheless bear in mind that in some circumstances these natural elements (like woods, lakes, marshes, lagoons, etc.) may have undergone drastic changes, both in extension and in quality, due to the anthropic impact in the last few centuries, a phenomenon much accelerated in the most recent decades. This caused the "contraction" of several natural boundaries compared to how they were in the past.

Another factor to be considered, on the opposite side, is that the newly defined Parks perimeters in some cases excluded shorelines, wet areas, or portions of forests of considerable interest, environments which were often included in the areas of activity of entomological expeditions.

From this it follows that only in specific circumstances the delimitation of the areas under study coincides quite faithfully with the administrative borders of the respective newly established protected areas (such as in Policoro Wood, Mount Vulture-Monticchio Lakes, Pantano Lake of Pignola) while this does not happen in other areas such as Gargano Promontory, Pollino Massif, Sila Plateau and Aspromonte. For this reason, it is here considered appropriate to briefly explain the boundaries as they were historically meant and which ones are adopted in this work, they are those generally meant in the "entomological" sense.

The study areas located in Apulia, Basilicata and Calabria are respectively indicated in figures 2, 3 and 4.

1. Gargano promontory (Apulia: Foggia province, Fig. 2) is a karst plateau that stretches out towards the Adriatic Sea, almost devoid of a superficial river network. It includes a great variety of peculiar environments ranging from the millenary Foresta Umbra to the Mediterranean scrub, from coastal lagoons to pre-desert hills and plains.

All records to the east of an ideal line linking the mouth of Fortore river with Poggio Imperiale, Apricena, San Marco in Lamis, San Giovanni Rotondo and Manfredonia have been included. The Gargano National Park (established by Law No. 394 of 6.12.1991) is part of this territory, but excludes the south-eastern coast between Vieste and Torre del Segnale, wide areas between Lake Varano and Carpino-Vico del Gargano as well as all the territories south of Lesina Lake.

Gargano Promontory was explored, from an entomological point of view, since 1887 but initially just a few finds were disclosed. Almost 20 years later, in 1906–1907, Holdhaus and his collaborators carried out long and thorough researches and the overall results were announced by Holdhaus himself (1911). In the following years the territory has been the subject of several researches promoted both by individual entomologists and by public institutions and many general works or dedicated to single families have been published.

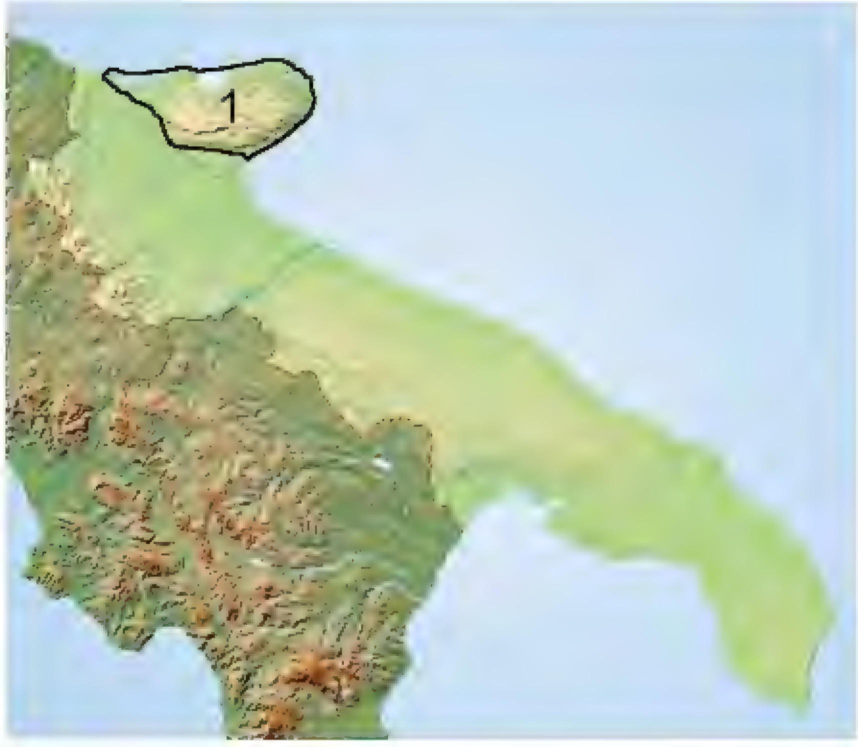

Figure 2. Apulia (Italy): 1. Gargano Promontory.

The writer undertook research in this area in the years 1970–1984 and published the overall results in a general catalogue in 1987; after this date he carried out further significant research aimed mainly at the investigation of the soil fauna.

2. Policoro Wood (Basilicata: Matera province, Fig. 3). The Riserva regionale Naturale Orientata Bosco Pantano di Policoro was established with L.R. n. 28 of 08.09.1999.

On the Ionian coast, historically, there was one of the southern most important floodplain forests, partially marshy, comprising the nuclei of Pantano soprano and Pantano sottano. In the XVIII century the extent of the forest was already much reduced but it was still described by travellers as an enchanted, luxuriant and uncontaminated place devoid even of viable trails. Nowadays only a very small portion of the old and renowned wood remains, with a limited naturalness degree, along the course of the river Sinni downstream of the Metaponto-Sibari railway and to the southeast of the interpoderal road that runs parallel to the railway at about 300 meters. An area of reforestation, mainly of *Pinus halepensis*, *Eucalyptus camaldulensis* and *E. globulosus*, has been included in the Reserve, east of the municipal road that leads from Policoro Wood to the dewatering system. The occasional floods of Sinni river pour debris on its outfall that sometimes carry an exceptional quantity of invertebrates (for example, on 17.IX.2000 sifting the beached debris, over 300 Coleoptera species were found).

The first entomological researches carried out on Policoro Wood are quite recent as they date back to 1956–1958 and the results were announced in a series of works that appeared between 1959 and 1979; the site gained notoriety and in the following years was the object of many explorations by entomologists from all over Italy but only a small number of the results was published in an organized manner, while many data were scattered in several papers.

The writer, together with his friend Fernando Montemurro, has done research here in the years 1976–1984 and published the overall results in a general catalogue in 1986. After this publication he carried out further research whose data are reported with the abbreviation “N” in the respective column of Table 1.

Parks of Lucanian Apennines (sites 3, 4, 5 and 6). The Lucan Apennines is a section of the southern Apennines that stretches as an arc from the Sella di Conza (between Campania and Basilicata) to Passo dello Scalone (in Calabria). It is bordered by the Ofanto river to the north, Sele to the west, Bradano to the east, from the Tyrrhenian to the south-west, from the plain of Sibari and the Gulf of Taranto to the south-east and also includes the mountains of Cilento in Campania and Orsomarso in Calabria.

The author gathered data all across this wide sector of the Apennines. For some areas he got a significant number of records on the coleopterological fauna (over a thousand species) and each of these areas will be separately treated: 3) Parks of Mount Vulture-Monticchio Lakes, 4) Regional Reserve of Pantano Lake of Pignola, 5) the complex Central Lucan Apennines-Sellata-Volturino-Viggiano-The Lagonegrese and Sirino massif, 6) Pollino National Park (partially). Below is a brief description of these sites, whose location is shown in figure 3, and respective National and Regional Parks exact designations based on the establishment acts.

On other areas of the Lucan Apennines, namely Cilento and Orsomarso Mountains, particularly interesting data are known as well as records referred to new species, but unfortunately not numerically significant, which is why it was preferred to omit them in this study.

3. Mount Vulture-Monticchio Lakes (Basilicata: Potenza province, Fig. 3) includes both the Parco Naturale Regionale del Vulture (established with L.R. n. 28 of 20.11.2017) and the Riserva Regionale Lago Piccolo di Monticchio (established with D.P.G.R. n. 1183 of 30.08.1984).

The woods of Mount Vulture, an ancient inactive volcano, surround two lakes of volcanic origin and are characterized by the remarkable variety of habitats and by very special microclimatic conditions which allow the presence of a low altitude beech forest (650 m a.s.l.). The site still has a sufficient degree of naturalness despite the massive tourist exploitation.

The first entomological researches on Mount Vulture and its lakes date back to 1880 and were made known two years later in a list including species collected also in other sites. In XX century the place was visited by numerous researchers with data published in several works. The entomological findings deduced from these contributions come from a small area around Mount Vulture: the summit, the territories adjacent the two lakes of Monticchio and the road that links the town of Rionero in Vulture to Mount Vulture.

The writer began occasional explorations in this area in 1970. A particularly intense period of research followed in the years 2000–2003, after which he drafted a report and a detailed list of collected species that he delivered to Basilicata Region.

4. Pantano Lake of Pignola (Basilicata, Potenza province, Fig. 3) was established as Riserva Regionale Lago Pantano di Pignola with D.P.G.R. n. 795 of 19.06.1984.

The lake, which occupies a piedmont depression at 750 m a.s.l. bounded to the north by Serra Stantiere, to the west by the ridges of Petrucco relief and to the south by the watershed of La Rocca, is managed by WWF and has a fair degree of naturality, although before being fenced it was subject to considerable upheavals. The reduced slope of the banks allows diversified aquatic vegetation, while the meadows and the sparse arboreal vegetation in contact with this ancient wetland are rich in ecological niches that make it an area of high biodiversity.

The only entomological researches on Pantano Lake of Pignola were conducted by the writer in the years 1991–1994 and were carried out along the entire perimeter of the lake, already fenced at the time. The results were released in a special publication by the WWF in 1996. After this publication further research was undertaken, the data of which are shown with the symbol “B” or “N” in the respective column.

5. Central Lucan Apennines-Central area Province of Potenza (Basilicata: Potenza and Matera provinces, Fig. 3) here refers to the “Sellata-Monte Croccia-Monte Volturino-Viggiano-Lagonegrese-Sirino massif” complex.

It is a complicated mountain system that constitutes the central backbone of Lucan Apennines, which varies in landscape from the harsh and almost dolomitic aspect of the northern peaks to the more gentle mountains of the Maddalena, to return to the grandeur of Mount Sirino massif and Mount Alpi in the southernmost offshoots. The whole territory is rich in woods that in the lower altitudinal zone are constituted by evergreen oaks and thermophilous broad-leaved trees and in the upper zone by *Quercus cerris* and mixed beech-woods, as well as some isolated chestnut groves and the residual forest of Abetina di Laurenzana, which hosts a local variety of *Abies alba*.

The entomological data shown come from places located between the middle and upper course of Basento and Sinni rivers; the north-western border lies between the sources of the Basento river (Fossa Cupa) and the villages of Brienza and Atena Lucana; the south-western boundary runs along the border with Campania region up to Lagonegro and, near Lauria, joins the Sinni river which represents its southern border thus including Mount Sirino and Mount Alpi; the southeast boundary is an ideal line connecting Salandra with Stigliano, Sant'Angelo and Valsinni.

In this area we find the following Reserves and National Parks:

a. Riserva Nazionale Naturale Antropologica Monte Croccia (established with D.M.A.F. of 11.09.1971);

b. Parco Regionale Gallipoli Cognato e Piccole Dolomiti Lucane (established with L.R. n. 47 of 24.11.1997);

c. Riserva Regionale Abetina di Laurenzana (established with D.P.G.R. n. 2 of 4.01.1988);

d. Riserva Regionale Lago Laudemio (established with L.R. n. 42 of 22.05.1980 and D.P.G.R. n. 426 of 19.04.1985);

e. Parco Nazionale dell'Appennino Lucano Val d'Agri Lagonegrese (established with D.P.R. of 8.12.2007);

f. A small part of Pollino National Park that protrude to the north of Sinni river and which, of significance, includes Mount Alpi.

News of the first research in Central Lucan Apennines dates back only to 1909 and there is no work of synthesis on the Coleoptera fauna; rather, there are many data dispersed in a myriad of works even with description of new species which refer to the second half of the last century.

The writer has carried out several researches, generally of short duration (1–5 days), between 1980 and 2000, but so far he had communicated only single data in contributions dedicated to specific families despite having found over 1,000 Coleoptera species.

6. Pollino Massif (Basilicata: Potenza and Matera provinces, Calabria: Cosenza province, Fig. 3). Parco Nazionale del Pollino was established with Law n. 67 of 11.03.1988; with subsequent acts and decrees the perimeter has been extended (Law n. 305 of 28.8.1989, D.M. of 31.12.1990, D.P.R. of 15.11.1993 and D.P.R. of 2.12.1997) so that it currently represents the largest national park in Italy. In it we find Riserva Naturale Biogenetica Statale Rubbio and Riserva Naturale Orientata Gole del Raganello in Basilicata, Riserva Naturale Statale Valle del Fiume Lao and Riserva Naturale Orientata Valle del Fiume Argentino in Calabria (Orsomarso mountains).

The Pollino Massif includes all the highest peaks of southern Apennines, whose forms have been shaped by the ancient glaciations and which for part of the year are covered by snowfields. The alternation of karstic phenomena and morainic deposits makes the landscape very evocative. Some

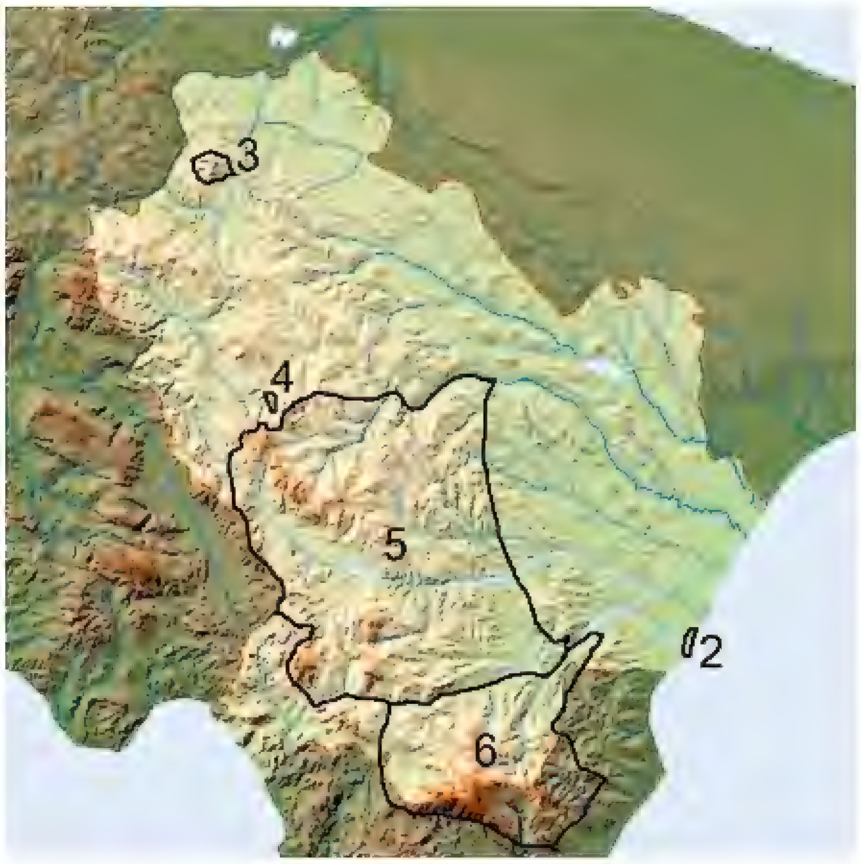

Figure 3. Basilicata (Italy): 2. Policoro Wood; 3. Mount Vulture-Monticchio Lakes; 4. Pantano Lake of Pignola; 5. Central Lucan Apennines; 6. Pollino Massif.

plant associations are unique to this area, where for example at the highest altitudes rare relict populations of *Pinus leucodermis* can be found. Also chestnut groves, oak woods and beech woods show noteworthy characteristics.

Considering the origin of most of the data, here it was intended for "Pollino" the whole area that includes the peaks of Monte Pollino, Serra del Prete, Dolcedorme, Serre di Crispo and Ciavole, Coppola di Paola and the neighboring territories; very different is the current perimeter of Pollino National Park extending from the Tyrrhenian to the Ionian.

Boundaries of Pollino Massif pass therefore to the north along the course of Sinni river from Episcopia (Potenza province) to Valsinni (Matera province), to the east and west follow the border with Calabria region but protrude widely from it at Alessandria del Carretto up to Francavilla Marittima where the southern border follows the course of Raganello stream and from here the localities of Frascineto, Morano Calabro, Campotenese and Mormanno. Pollino Massif shows a barely acceptable state of naturalness, although the anthropic impact is definitely excessive and favored both by the construction of new roads and by poor surveillance.

The first research on Pollino Massif dates back to 1880 and was published in 1882. Later it was the subject of studies whose results were only partially published; starting from the middle of last century wider research campaign were promoted by Naples University and finally the results were published in 17 works dedicated to Coleoptera. Several other researches have been carried out by single entomologist whose data were dispersed in many papers or made known in contributions dedicated to single families.

The writer used to explore Pollino Massif in the years 1969-1985 and he published the overall results in a general catalogue in 1986. Later he further investigated the area until around 2000, collecting nearly 500 further species.

7. Sila Plateau (Calabria: Cosenza, Catanzaro and Crotone provinces, Fig. 4). Parco Nazionale della Sila was established with Law n. 344 of 8.10.1997 and D.P.R. of 14.11.2002. In 2014 the site was included in the UNESCO Man and Biosphere Program.

It is one of the areas that are historically less populated and with the highest percentage of wooded surface of Italy. The plateau is made up of igneous and metamorphic rocks that clearly differentiate it from the calcareous bulk of the Apennines and that influence the form of the landscape, as well as that of the vegetation. In fact, at high altitudes, *Pinus nigra laricio* dominates and, even higher, *Fagus sylvatica*, frequently interspersed with *Abies alba*.

The data considered in this work and often reported by the authors as "Sila" concern an area that extends far beyond the boundaries of Sila National Park, as it includes wide wooded areas to the north and east of Cecita Lake and both east and west of Ampollino Lake as well as to south of the latter. As far as man's impact is concerned, the same is true as for what was said about Pollino Massif, though the situation is slightly better.

The first researches in Sila Plateau date back to 1859, but these results were never disclosed. Later it was the subject of further explorations, of which only some were published in their entirey in 1881, 1941 and 1943, while other data were dispersed in a myriad of contributions. In the 1960s the territory was the subject of a research project promoted by Verona Museum and the results relating to some of the families were announced in several papers. Meanwhile and subsequently the Pollino Massif had become the destination of a large number of entomologists whose results were only partially communicated in numerous contributions.

The writer in the years 1969–1988 visited Sila Plateau several times for periods of 7–15 days and therefore disclosed the results of its collections in a general catalogue in 1991.

8. Aspromonte (Calabria: Reggio Calabria province, Fig. 4). Parco Nazionale dell'Aspromonte was established with Law n. 305 of 28.08.1989, D.P.R. of 14.01.1994 and D.P.R. of 19.07.2008).

This is a mountainous massif with a jagged topography occupying the southernmost tip of the Stivale (the Boot: in a figurative sense, par excellence, Italy, so called because of its geographical shape that resembles that of a boot) and whose flora and fauna are extremely heterogeneous due to multiple factors: the low latitude, the elevation height differences, the presence of tectonic terraces as well as the proximity of the sea and the different exposure of mountainsides respect to this. Like Sila Plateau, Aspromonte consists of rocks more similar to Alpine ones than those of the Apennines, and also here in the woods the *Pinus nigra laricio* is predominant above 800 m, while from the 1,200 m and at higher altitudes the prevailing tree cover is *Fagus sylvatica* and *Abies alba*. A peculiar feature of superficial hydrography is the "fiumara", a characteristic type of watercourse with a very wide pebbly bed and for most of the year dry, but seasonally subject to flash floods.

In this work, Aspromonte is meant in a geographical sense and therefore is that area located south of Petrace river and of "fiumare" of Platì and Careri; it is thus considered a portion of territory that is more than double in area compared to that of the National Park. This choice was made both to include the many data reported over almost two centuries of entomological investigations and to not exclude the fauna of the coasts, which has particularly interesting but different species to that of the mountainous areas.

It should be noted here that mainly the fauna of south-eastern territories, riparian and not, between Locri and Ionian Saline is particularly interesting also because of the different geology, nature of the soil, and the degree of man's influence compared to that of the territory located to the west between Rosarno and Reggio Calabria. The general impact of man's activities is more or less analogous to that of other National Parks of southern Italy, considering that "Park" in this region often means uncontrolled tourism and illegal building rather than carefully safeguarding the natural environments that remain.

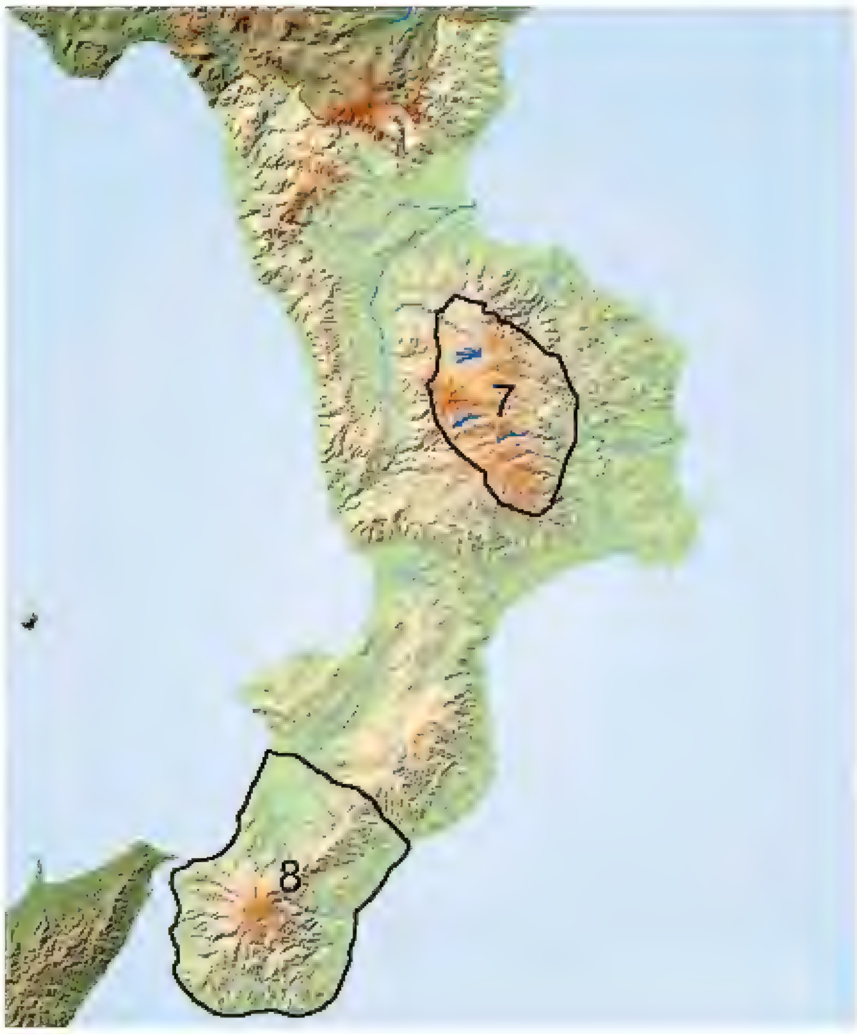

Figure 4. Calabria (Italy): 7. Sila Plateau; 8. Aspromonte.

Of the eight sites here treated, Aspromonte, approached by sea from Sicily, is the one that was first investigated with research dating back to 1783, the results being announced three years later. Further studies bear dates of the first half of XIX century demonstrating the attraction that this site had already gained among entomologists two centuries ago. The research continued discontinuously and with data published only partially until the mid-twentieth century, when Aspromonte was the object of accurate research by members of the expeditions promoted by Verona Museum and the results concerning some families were announced in various papers. In the following years further short journeys were made by several entomologists, some of whom did not publish any results and other who did so sporadically in various works.

The writer visited Piani d'Aspromonte for the first time around 1975 and until 2000 undertook many and accurate researches, though the results until now were released only minimally in various publications dedicated to single families.

Samples

In order to integrate and update the previous catalogues, all the publications that could be found were consulted. Every paper bearing data on southern Italy has been carefully examined, and possible synonymies and taxonomic status changes have been checked.

Furthermore, the new records resulting from the research carried out by the author himself after the publication of the aforementioned catalogues are reported.

For field research, a wide range of collecting techniques has been used, mainly on sight, with collecting nets, entomological umbrella, sifting (of leaf litter, rotten wood, hay, mushrooms, dung, soil under stones in meadows or woods, etc.) combined with the use of Winkler/Moczarski extractors, light traps, collecting net for aquatic beetles, aerial and pitfall traps both with and without attractive baits.

All the study material has been identified by specialists but substantial quantities of specimens are still undetermined (17,000 Staphylinidae, 10,000 Ptiliidae, 7,500 Nitidulidae, 3,700 Scydmaeninae, over 3,000 Mordellidae and Scraptiidae, 2,100 Bruchinae, 1,700 Phalacridae, 1,700 Corylophidae, 1,300 Alexiidae, 600 Clambidae).

Most of the specimens collected by the writer are kept in the author's personal collection, currently deposited at the Museum of Natural History, Section of Zoology, of Florence University.

The results are shown in Table 1, in which the families are listed according to the taxonomic order adopted by Bouchard et al. (2011).

For the nomenclature, the status and the sequence of subfamilies and tribes within of families, reference was made to volumes 1–8 of the "Catalogue of Palaearctic Coleoptera", with some adjustments according to the works listed below:

Ptiliidae: Sörensson & Delgado, 2019
Elateroidea: Kundrata et al., 2014
Elateridae: Kundrata et al., 2018
Drilini: Kundrata & Bocak, 2011
Cebrionini: Kundrata & Bocak, 2011
Peltidae: Gimmel et al., 2019
Lophocateridae: Gimmel et al., 2019
Trogossitidae: Gimmel et al., 2019
Thymalidae: Gimmel et al., 2019
Rhadalidae: Bocakova et al., 2011; Gimmel et al., 2019
Malachiinae: Gimmel et al., 2019
Dasytinae: Gimmel et al., 2019
Cucujoidea - Coccinelloidea: Robertson et al., 2015
Nitidulidae: Cline et al., 2014
Cybocephalidae: Cline et al., 2014
Teredidae: Robertson et al., 2015
Anamorphidae: Robertson et al., 2015
Mycetaeidae: Robertson et al., 2015
Curculionoidea: Alonso-Zarazaga et al., 2017

Also consulted were the works of Żyła & Solodovnikov (2019), Vasilikopoulos et al. (2019) and Zhang et al. (2018) but it was considered more appropriate not to take them into account here.

Names, initials and diacritical marks of the various authors have been verified on Bousquet (2016).

Species, contrariwise, are listed in alphabetical order for the simple fact that names of eventual subgenus have been omitted to make the "Species" column more manageable.

The species lists, subdivided by family, were subjected to a critical examination by the colleagues referred to in the "Acknowledgments" chapter, who reviewed the taxonomic status and added unpublished data eventually in their possession.

Taxonomic status of species and of superior categories is updated to 31.12.2019.

Symbols used in Table 1:

X: species previously reported in the author's catalogues of Gargano Promontory, Policoro Wood, Pantano Lake of Pignola, Pollino Massif and Sila Plateau;

B: new bibliographic data, relating to the areas already mentioned as well as to Mount Vulture-Monticchio Lakes, Central Lucan Apennines and Aspromonte. In cases where the presence of a species in a given area is documented both in the bibliography and in CKmap, it was preferred to report the record with the symbol "B";

CK: data resulting from "CKmap" (national database) if not otherwise published;

H: Holdhaus citations (1911) concerning Gargano Promontory and omitted in the author's previous contribution to this promontory (Angelini, 1987);

N: new data from the author, if not already mentioned in other publications and then reported with the symbol "B";

!: records added by specialists who have reviewed the families of their competence: Paolo Audisio (Hydraenidae and Nitidulidae), Cesare Bellò (Curculionidae), Mauro Daccordi (Chrysomelidae), Jiří Háva (Dermestidae), Francesco Izzillo (Buprestidae and Cerambycidae), Leonardo Latella (Carabidae), Carlo Leonardi (Alticinae), Gianfranco Liberti (Rhadalidae and Melyridae), Andrea Liberto (Oedemeridae), Gianluca Magnani (Buprestidae), Alessandro Mascagni (Elmidae and Dryopidae), Antonio Mazzei (Carabidae), Giuseppe Platia (Elateridae), Roberto Poggi (Pselaphinae), Saverio Rocchi (Helophoridae), Davide Sassi (Chrysomelidae), Pierpaolo Vienna (Histeridae), Adriano Zanetti (Staphylinidae), Iuri Zappi (Cleridae).

[E]: endemic species.

The "IUCN Category" column shows the IUCN (International Union for the Conservation of Nature and Natural Resources) Categories, as adopted in the Italian Red Lists of saproxylic Coleoptera referred to, compiled by Audisio et al. (2014) and Carpaneto et al. (2015), and the same abbreviations are used.

Table 1. THE LIST OF SPECIES found in the eight study sites.

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
COLEOPTERA Linnaeus, 1758 **MYXOPHAGA** Crowson, 1955 **SPHAERIUSOIDEA** Erichson, 1845									
SPHAERIUSIDAE Erichson, 1845 Hájek in Cat. Pal. Col., vol. 1, 2017									
Microsporus acaroides Waltl, 1838		N							
ADEPHAGA Schellenberg, 1806									
GYRINIDAE Latreille, 1810 **Gyrininae** Latreille, 1810 **Gyrinini** Latreille, 1810 Hájek & Fery in Cat. Pal. Col., vol. 1, 2017									
Aulonogyrus concinnus (Klug, 1834)		X							
Aulonogyrus striatus (Fabricius, 1792)		X		N	B	X	X	B	
Gyrinus caspius Ménétriés, 1832	H	X		N	B		X	B	
Gyrinus dejeani Brullé, 1832	H	X			B	B			
Gyrinus distinctus Aubé, 1838			B						
Gyrinus substriatus Stephens, 1828	X	X	X	B	N	X	X	B	
Gyrinus suffriani W. Scriba, 1855		X							
Gyrinus urinator Illiger, 1807	X	X	X	N	B	N	X	B	
Orectochilini Régimbart, 1882									
Orectochilus villosus villosus (O.F. Müller, 1776)	B	X			B			N	
RHYSODIDAE Laporte, 1840 **Clinidiini** R.T. Bell & J.R. Bell, 1978 Huber, Marggi & Löbl in Cat. Pal. Col., vol. 1, 2017									
Clinidium canaliculatum (O.G. Costa, 1839)					B	X	X	B	NT
Omoglymmiini R.T. Bell & J.R. Bell, 1978									
Omoglymmius germari (Ganglbauer, 1891)	X	X		B	B	B		N	CR
Rhysodini Laporte, 1840									
Rhysodes sulcatus (Fabricius, 1787)	B			B	B				CR
CARABIDAE Latreille, 1802 **Nebriinae** Laporte, 1834 **Nebriini** Laporte, 1834 Huber in Cat. Pal. Col., vol. 1, 2017 (Genus *Leistus* : Farkač)									
Eurynebria complanata (Linnaeus, 1767)	X							B	
Leistus ferrugineus (Linnaeus, 1758)					B				
Leistus fulvibarbis fulvibarbis Dejean, 1826	H	X	X	B	B	X	X	B	
Leistus parvicollis Chaudoir, 1869	H								
Leistus rufomarginatus (Duftschmid, 1812)	H				N	X		B	
Leistus spinibarbis fiorii Lutshnik, 1913 [E]	B?		X	B	B	X	X	B	
Nebria andalusia Rambur, 1837								B	
Nebria brevicollis (Fabricius, 1792)	H	X		B	B	X	X	B	
Nebria kratteri kratteri Dejean, 1831 [E]				B	B	X	X	B	
Nebria pennisii Magrini, 1987 [E]					B				
Nebria psammodes (P. Rossi, 1792)	H	X		B	N	X	X	B	
Notiophilini Motschulsky, 1850 Bousquet in Cat. Pal. Col., vol. 1, 2017									
Notiophilus aestuans Dejean, 1826		N		N		X	X	B	
Notiophilus aquaticus (Linnaeus, 1758)						X		B	
Notiophilus biguttatus (Fabricius, 1779)	X			B	N	X	X	B	

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Notiophilus geminatus Dejean, 1831	X	X	X	B		X	X	B	
Notiophilus germinyi Fauvel, 1863								N	
Notiophilus palustris (Duftschmid, 1812)				B	B				
Notiophilus quadripunctatus Dejean, 1826	H						B	B	
Notiophilus rufipes Curtis, 1829	H	X		B	B	X	X	B	
Notiophilus substriatus G.R. Waterhouse, 1833	H	X	X	B		X	X	B	
Carabinae Latreille, 1802 **Carabini** Latreille, 1802 **Calosomatina** Lapouge, 1927 Häckel in Cat. Pal. Col., vol. 1, 2017									
Calosoma inquisitor inquisitor (Linnaeus, 1758)	H	X		N		X	X		
Calosoma maderae maderae (Fabricius, 1775)	X	X						B	
Calosoma sycophanta sycophanta (Linnaeus, 1758)	N	X		N	B	X	B	B	
Carabina Latreille, 1802 Brezina, Huber & Marggi in Cat. Pal. Col., vol. 1, 2017									
Carabus convexus convexus Fabricius, 1775	H			B	CK	X	CK	B	
Carabus coriaceus coriaceus Linnaeus, 1758	H	X	X	N	CK	X			
Carabus coriaceus bruttianus Born, 1906 [E]							B	B	
Carabus granulatus aetolicus Schaum, 1857		B						B	
Carabus granulatus calabricus Spettoli & Vigna Taglianti, 2001 [E]						N			
Carabus lefebvrei bayardi Solier, 1835 [E]	H	X		CK	B	X	X		
Carabus lefebvrei lefebvrei Dejean, 1826 [E]								B	
Carabus morbillosus alternans Palliardi, 1825 [E]		B						B	
Carabus preslii neumeyeri Schaum, 1856				B	B	X	X	B	
Carabus rossii Dejean, 1826 [E]	H			B	N	CK	X	B	
Carabus violaceus picenus A. Villa & G.B. Villa, 1839	X		X	B	CK	X	X	B	
Cychrini Perty, 1830 **Cychrina** Perty, 1830 Häckel in Cat. Pal. Col., vol. 1, 2017									
Cychrus attenuatus latialis Luigioni, 1922 [E]					B				
Cychrus italicus Bonelli, 1810				N	B	B	X	B	
Cicindelinae Latreille, 1802 **Cicindelini** Latreille, 1802 **Cicindelina** Latreille, 1802 Putchkov & Matalin in Cat. Pal. Col., vol. 1, 2017									
Calomera littoralis nemoralis (A.G. Olivier, 1790)	H	X						B	
Cassolaia maura cupreothoracica Korell & Cassola, 1987								B	
Cephalota circumdata circumdata (Dejean, 1822)		B							
Cicindela campestris campestris Linnaeus, 1758	X	X	X		B	X	X	B	
Cicindela majalis Mandl, 1935 [E]		X			B		X	N	
Cylindera arenaria arenaria Fuessly, 1775		X							
Cylindera germanica muelleri (Magistretti, 1966)	X	X							
Cylindera trisignata trisignata (Dejean, 1822)	X	X							
Myriochila melancholica melancholica (Fabricius, 1798)	X								
Loricerinae Bonelli, 1810 **Loricerini** Bonelli, 1810 Bousquet in Cat. Pal. Col., vol. 1, 2017									
Loricera pilicornis pilicornis (Fabricius, 1775)						X	X		
Elaphrinae Latreille, 1802 **Elaphrini** Latreille, 1802 Goulet in Cat. Pal. Col., vol. 1, 2017									

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Elaphrus uliginosus Fabricius, 1792					N	N	X		
Omophroninae Bonelli, 1810 **Omophronini** Bonelli, 1810 Huber, Marggi & Valainis in Cat. Pal. Col., vol. 1, 2017									
Omophron limbatum (Fabricius, 1777)	X	X			N	N	B	B	
Scaritinae Bonelli, 1810 **Clivinini** Rafinesque, 1815 **Clivinina** Rafinesque, 1815 Balkenhol in Cat. Pal. Col., vol. 1, 2017									
Clivina collaris (Herbst, 1784)		N				N	B	N	
Clivina fossor fossor (Linnaeus, 1758)	X	X	X	N	N	X		B	
Clivina laevifrons Chaudoir, 1842		N							
Reicheia italica Holdhaus, 1924 [E]				N	B	N	N	B	
Typhloreicheia usslaubi (Saulcy, 1870) [E]	H				B				
Dyschiriini H.J. Kolbe, 1880									
Dyschirius apicalis Putzeys, 1846	X	X						B	
Dyschirius auriculatus auriculatus Wollaston, 1867								B	
Dyschirius chalybeus chalybeus Putzeys, 1846		X	N					N	
Dyschirius cylindricus hauseri A. Fleischer, 1898	B								
Dyschirius gracilis gracilis (Heer, 1837)		N					X		
Dyschirius importunus importunus Schaum, 1857	X	X			N			B	
Dyschirius intermedius Putzeys, 1846		X							
Dyschirius laeviusculus Putzeys, 1846		N							
Dyschirius luticola luticola Chaudoir, 1850	X	X							
Dyschirius minutus minutus (Dejean, 1825)								B	
Dyschirius nitidus nitidus (Dejean, 1825)		X							
Dyschirius numidicus numidicus Putzeys, 1846	X	X							
Dyschirius parallelus ruficornis Putzeys, 1846		X							
Dyschirius punctatus (Dejean, 1825)		X						B	
Dyschirius salinus salinus Schaum, 1843		X							
Dyschirius strumosus Erichson, 1837		N							
Dyschirius substriatus substriatus (Duftschmid, 1812)		X							
Scaritini Bonelli, 1810 **Scaritina** Bonelli, 1810									
Distichus planus (Bonelli, 1813)	X							B	
Scarites buparius (Forster, 1771)	X	X						B	
Scarites laevigatus Fabricius, 1792	X	X						B	
Scarites terricola terricola Bonelli, 1813	X	X						B	
Apotominae LeConte, 1853 Wrase in Cat. Pal. Col., vol. 1, 2017									
Apotomus rufithorax Pecchioli, 1837		N	B						
Apotomus rufus (P. Rossi, 1790)								B	
Siagoninae Bonelli, 1813 **Siagonini** Bonelli, 1813 Huber & Marggi in Cat. Pal. Col., vol. 1, 2017									
Siagona europaea europaea Dejean, 1826		B		N	N	X	B	B	
Trechinae Bonelli, 1810 **Anillini** Jeannel, 1937 Zaballos, Pérezgonzáles, Andújar Fernández & Giachino in Cat. Pal. Col., vol. 1, 2017									
Anillus bordonii Magrini & Vanni, 1993 [E]					B			B	
Rhegmatobius fiorii (Ganglbauer, 1900) [E]					B				

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Rhegmatobius solarii Magrini & Sciaky, 1995 [E]					B	B			
Bembidiini Stephens, 1827 **Bembidiina** Stephens, 1827 Marggi, Toledano & Neri in Cat. Pal. Col., vol. 1, 2017									
Asaphidion curtum curtum (Heyden, 1870)		X		N	N	X	X	N	
Asaphidion flavipes (Linnaeus, 1760)						N			
Asaphidion nebulosum nebulosum (P. Rossi, 1792)		X			B	X	X	B	
Asaphidion rossii (Schaum, 1857)		X		B	B	X	X	B	
Asaphidion stierlini (Heyden, 1880)	H			B		X	X	B	
Bembidion ambiguum Dejean, 1831								B	
Bembidion andreae (Fabricius, 1787)		X		N	N	X	X	B	
Bembidion articulatum (Panzer, 1796)	X	X	X	B	N	N	X	N	
Bembidion assimile Gyllenhal, 1810		X	N	N	N	N		N	
Bembidion axillare occiduum Marggi & Huber, 2001	N	X						N	
Bembidion azurescens azurescens Dalla Torre, 1877	X	X				N		B	
Bembidion biguttatum (Fabricius, 1779)					N		X		
Bembidion bipunctatum bipunctatum (Linnaeus, 1760)						X	X		
Bembidion bualei bualei Jacquelin du Val, 1852		X		B	N	X	X	B	
Bembidion bugnioni K. Daniel, 1902		X		B	B	X	X	B	
Bembidion callosum callosum Küster, 1847		X		N		X	X	B	
Bembidion concoeruleum Netolitzky, 1943					B				
Bembidion decorum decorum (Panzer, 1799)	X			N	B	X	X	B	
Bembidion deletum deletum Audinet-Serville, 1821				B		X	X		
Bembidion demartini Neri & Gudenzi, 2011 [E]					N	X	X	N	
Bembidion ephippium (Marsham, 1802)	X							B	
Bembidion escherichi escherichi Ganglbauer, 1897						X			
Bembidion femoratum femoratum Sturm, 1825		X				B			
Bembidion fuliginosum Netolitzky, 1914 [E]		N		N	B	B		B	
Bembidion genei illigeri Netolitzky, 1914	B	X	X	B	B	X	X	B	
Bembidion geniculatum geniculatum (Heer, 1837)				N	B	X	X	B	
Bembidion gudenzii Neri, 1981 [E]				N	B	X	X	B	
Bembidion huberi Marggi, 2008					B				
Bembidion hummleri hummleri G. Müller, 1918								B	
Bembidion hypocrita hypocrita Dejean, 1831					B	X		B	
Bembidion inoptatum Schaum, 1857	X	X	X		N				
Bembidion iricolor Bedel, 1879	X	X			N				
Bembidion italicum De Monte, 1943		X	X		B	X		B	
Bembidion jacqueti apenninum De Monte, 1843 [E]						B			
Bembidion lampros (Herbst, 1784)	H	X		B	B	X	X	B	
Bembidion latinum Netolitzky, 1911	H	X	X	B	B	X	X	B	
Bembidion latiplaga latiplaga Chaudoir, 1850		X		N	N	X	X	N	
Bembidion lucifugus (Neri & Pavesi, 1989) [E]					B			B	
Bembidion lunulatum (Geoffroy, 1785)	H	X			N	N	X	B	
Bembidion nigropiceum (Marsham, 1802)	B								
Bembidion nobile Rottenberg, 1870		X		B	N	X	X	B	
Bembidion normannum normannum Dejean, 1831		X		N					
Bembidion octomaculatum (Goeze, 1777)	N	X	X	B	N	N	X	N	
Bembidion praeustum Dejean, 1831	H	X	X	N	B	X	X	B	
Bembidion properans (Stephens, 1828)	H			B	N	N			
Bembidion punctulatum punctulatum Drapiez, 1820	X	X	N	B	N	X	N	B	
Bembidion quadripustulatum quadripustulatum Audinet-Serville, 1821			X		B	N			
Bembidion rectangulum Jacquelin du Val, 1852								N	

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Bembidion scapulare scapulare Dejean, 1831		X				N		B	
Bembidion semipunctatum (Donovan, 1806)					N				
Bembidion siculum siculum Dejean, 1831 [E]					B			B	
Bembidion steinbuehleri steinbuehleri Ganglbauer, 1891	B								
Bembidion subfasciatum Chaudoir, 1850	X	B							
Bembidion tenellum tenellum Erichson, 1837	X	N	X	N	N	N		B	
Bembidion testaceum testaceum (Duftschmid, 1812)		X							
Bembidion tethys Netolitzky, 1926	X	N			B	N			
Bembidion tetracolum tetracolum Say, 1823		N			N	N		N	
Bembidion varicolor varicolor (Fabricius, 1803)						N	N	B	
Bembidion varium (A.G. Olivier, 1795)		N	X		N	N		B	
Bembidion vseteckai dissimile G. Müller, 1943								B	
Ocys harpaloides (Audinet-Serville, 1821)		X	N	N	B		B	B	
Sinechostictus cribrum stenacrus (De Monte, 1947) [E]								B	
Sinechostictus dahlii (Dejean, 1831)		X	X		B	N	X	B	
Sinechostictus doderoi (Ganglbauer, 1891)					B				
Sinechostictus elongatus (Dejean, 1831)					N			B	
Sinechostictus inustus (Jacquelin du Val, 1857)					B				
Sinechostictus solarii (G. Müller, 1918) [E]					B				
Tachyina Motschulsky, 1862 Kopecký in Cat. Pal. Col., vol. 1, 2017									
Polyderis algiricus (P.H. Lucas, 1846)	H	X						B	
Polyderis brevicornis (Chaudoir, 1846)		N							
Porotachys bisulcatus (Nicolai, 1822)	N	X	N		N	N	X	B	
Tachys bistriatus bistriatus (Duftschmid, 1812)	H	X	X	N	N	N		N	
Tachys fulvicollis (Dejean, 1831)		X	X	B					
Tachys micros (Fischer von Waldheim, 1828)	X	N						B	
Tachys scutellaris scutellaris Stephens, 1828	X	X		N	N			B	
Tachyta nana nana (Gyllenhal, 1810)	H					X	B		
Tachyura diabrachys (Kolenati, 1845)	X	X	X	B	N	N	X	B	
Tachyura haemorrhoidalis (Ponza, 1805)	X	X	X		N			B	
Tachyura parvula (Dejean, 1831)		N	X					B	
Tachyura sexstriata (Duftschmid, 1812)			X		N	X	X	B	
Tachyura thoracica (Kolenati, 1845)					N			N	
Pogonini Laporte, 1834 Bousquet in Cat. Pal. Col., vol. 1, 2017									
Pogonistes gracilis (Dejean, 1828)								B	
Pogonus chalceus chalceus (Marsham, 1802)		B							
Pogonus gilvipes Dejean, 1828	X							B	
Pogonus littoralis (Duftschmid, 1812)		X							
Pogonus riparius Dejean, 1828	X	X							
Trechini Bonelli, 1810 **Perileptina** Sloane, 1903 Belousov in Cat. Pal. Col., vol. 1, 2017									
Perileptus areolatus areolatus (Creutzer, 1799)	N	X	X	B	N	X		B	
Trechina Bonelli, 1810									
Duvalius caoduroi Pace, 1986 [E]					B				
Trechus angelae Magrini, 1984 [E]					B	X			
Trechus arthuri P. Moravec & Lompe, 2003 [E]				N	B	X			
Trechus binotatus Putzeys, 1870				N	B	X			
Trechus obtusus obtusus Erichson, 1837				B	B	X	X	N	
Trechus quadristriatus (Schrank, 1781)	H	X	X	B	CK	X	X	B	
Trechus subnotatus Dejean, 1831					N				

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Trechodina Jeannel, 1926									
Thalassophilus longicornis (Sturm, 1825)								B	
Brachininae Bonelli, 1810 **Brachinini** Bonelli, 1810 **Brachinina** Bonelli, 1810 Hrdlička in Cat. Pal. Col., vol. 1, 2017									
Brachinus bayardi Dejean, 1831		X							
Brachinus brevicollis Motschulsky, 1844							B		
Brachinus crepitans (Linnaeus, 1758)	H	X	X	N	N	X	B	B	
Brachinus elegans Chaudoir, 1842	H								
Brachinus exhalans (P. Rossi, 1792)	X	X							
Brachinus explodens Duftschmid, 1812	H				B	X	X	N	
Brachinus immaculicornis immaculicornis Dejean, 1826		X		B			B	B	
Brachinus italicus (Dejean, 1831) [E]		X	X	N	N	N	X	B	
Brachinus nigricornis Gebler, 1830	N	X		N					
Brachinus plagiatus Reiche, 1868	H	X	X						
Brachinus psophia Audinet-Serville, 1821		N				N	B	B	
Brachinus sclopeta (Fabricius, 1792)	H	X		N	N	X	B		
Harpalinae Bonelli, 1810 **Chlaeniini** Brullé, 1834 **Callistina** Laporte, 1834 Kirschenhofer in Cat. Pal. Col., vol. 1, 2017									
Callistus lunatus lunatus (Fabricius, 1775)			N			B	B	B	
Chlaeniina Brullé, 1834									
Chlaenius chrysocephalus (P. Rossi, 1790)	H	X		N	N	X	B	B	
Chlaenius circumscriptus (Duftschmid, 1812)		N						B	
Chlaenius decipiens (L. Dufour, 1820)	H	B					B	B	
Chlaenius festivus (Panzer, 1796)	H	X		N	N	N		B	
Chlaenius nigricornis (Fabricius, 1787)	B	X						B	
Chlaenius nitidulus (Schrank, 1781)		N			N			B	
Chlaenius olivieri Crotch, 1871	H						X	B	
Chlaenius spoliatus spoliatus (P. Rossi, 1792)	H	X		N	N	X	N	B	
Chlaenius terminatus Dejean, 1826		B							
Chlaenius tristis tristis (Schaller, 1783)	B	B	X			N			
Chlaenius velutinus (Duftschmid, 1812)			X			X		B	
Chlaenius vestitus (Paykull, 1790)	H	X	X	B	N	X	X	B	
Drypta dentata (P. Rossi, 1790)	N	X	X	N	N			N	
Drypta distincta (P. Rossi, 1792)		X						B	
Harpalini Bonelli, 1810 **Amblystomina** Fauvel, 1889 Wrase in Cat. Pal. Col., vol. 1, 2017									
Amblystomus metallescens (Dejean, 1829)	X	X		N	N	X		B	
Amblystomus niger (Heer, 1841)	X	X	X						
Amblystomus solsky Reiche, 1864		X						B	
Anisodactylina Lacordaire, 1854 Kataev & Wrase in Cat. Pal. Col., vol. 1, 2017									
Anisodactylus binotatus (Fabricius, 1787)	H	X		B	B	X	X	B	
Anisodactylus intermedius Dejean, 1829		X							
Anisodactylus poeciloides poeciloides (Stephens, 1828)	X	N							
Anisodactylus pueli bucciarellii Sciaky, 1979 [E]	B				B				
Anisodactylus virens virens Dejean, 1829	X	X							
Diachromus germanus (Linnaeus, 1758)	H	X	N	B	N		X	N	

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Gynandromorphus etruscus (Quensel, 1806)			X				X		
Scybalicus oblonginsculus (Dejean, 1829)	X	X	X		B	X	B		
Ditomina Bonelli, 1810 Wrase & Kataev in Cat. Pal. Col., vol. 1, 2017									
Carterus dama (P. Rossi, 1792)	H						B	B	
Carterus fulvipes (Latreille, 1817)					N			B	
Carterus gilvipes (Piochard de la Brûlerie, 1873)						B		B	
Carterus rotundicollis Rambur, 1837	N	X		N		X	B	B	
Ditomus calydonius calydonius (P. Rossi, 1790)	H	X			B		B	B	
Ditomus tricuspidatus (Fabricius, 1792)	H						X	B	
Dixus clypeatus (P. Rossi, 1790)	H	N				X	X	B	
Dixus obscurus (Dejean, 1825)	X	N							
Graniger femoralis (Coquerel, 1859)					B				
Oedesis caucasicus (Dejean, 1831)		B							
Oedesis villosulus (Reiche, 1860)								B	
Tschitscherinellus cordatus cordatus (Dejean, 1825)							B		
Harpalina Bonelli, 1810 Kataev & Wrase in Cat. Pal. Col., vol. 1, 2017									
Acinopus ammophilus Dejean, 1829		X					B	N	
Acinopus baudii baudii A. Fiori, 1913 [E]								B	
Acinopus megacephalus (P. Rossi, 1794)	X			N		X	X	B	
Acinopus picipes (A.G. Olivier, 1795)	H	X		N		X	X		
Daptus vittatus Fischer von Waldheim, 1823		B							
Harpalus affinis (Schrank, 1781)	X	N		B	B	X	X	B	
Harpalus anxius (Duftschmid, 1812)	H			B	N				
Harpalus atratus Latreille, 1804	X			B	B	N	X	B	
Harpalus attenuatus Stephens, 1828	X	X		N		X	X		
Harpalus calceatus Duftschmid, 1812	B								
Harpalus cupreus cupreus Dejean, 1829	H		X	N	B	N	B	B	
Harpalus decipiens Dejean, 1829	X			B		X	X	B	
Harpalus dimidiatus (P. Rossi, 1790)	H	X	X	N	B	X		N	
Harpalus distinguendus distinguendus (Duftschmid, 1812)	H	X		N	B	X	X	B	
Harpalus flavicornis flavicornis Dejean, 1829	H		X	B	N			N	
Harpalus griseus (Panzer, 1796)	X	X	X			N		B	
Harpalus honestus (Duftschmid, 1812)	H			N	B	X		N	
Harpalus italus Schaum, 1860	H		X						
Harpalus litigiosus Dejean, 1829	X								
Harpalus melancholicus reicheianus Kataev, 2012	X	X				X		B	
Harpalus oblitus oblitus Dejean, 1829	H			N	B	X	X		
Harpalus pumilus Sturm, 1818							X	B	
Harpalus punctatostriatus Dejean, 1829					N				
Harpalus pygmaeus Dejean, 1829	X								
Harpalus rubripes (Duftschmid, 1812)	X	X	X	B	N	X	X	B	
Harpalus rufipalpis rufipalpis Sturm, 1818							B		
Harpalus rufipes (DeGeer, 1774)	H	X	X	B	N	X	X	B	
Harpalus serripes serripes (Quensel, 1806)	H	X		B	B	X	X	B	
Harpalus siculus Dejean, 1829								B	
Harpalus smaragdinus (Duftschmid, 1812)		N		N	N				
Harpalus sulphuripes sulphuripes Germar, 1823	H	N		B	B	B	X	B	
Harpalus tardus (Panzer, 1796)	H			B	B	X	X	B	
Harpalus tenebrosus tenebrosus Dejean, 1829	H	N	X	B					
Ophonus ardosiacus (Lutshnik, 1922)		N	X				B		
Ophonus azureus (Fabricius, 1775)	H			N	B	X		B	

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Ophonus cordatus (Duftschmid, 1812)	X					X			
Ophonus cribricollis (Dejean, 1829)	X								
Ophonus diffinis (Dejean, 1829)	X	N							
Ophonus ferrugatus Reitter, 1902								N	
Ophonus franziniorum Sciaky, 1987		N						B	
Ophonus incisus (Dejean, 1829)	X				B		B	B	
Ophonus jeanneli Sciaky, 1987	B				N		N		
Ophonus melletii melletii (Heer, 1837)			N	B		B			
Ophonus parallelus (Dejean, 1829)						N			
Ophonus puncticeps Stephens, 1828	X	N	N		N		X	B	
Ophonus puncticollis (Paykull, 1798)	B			B					
Ophonus rotundatus (Dejean, 1829)		X	X		N			B	
Ophonus rufibarbis (Fabricius, 1792)	B		X	B	B		B	N	
Ophonus rupicola (Sturm, 1818)	X	N	X		B	X	B		
Ophonus sabulicola (Panzer, 1796)	H		X	N		X	B	B	
Ophonus schaubergerianus (Puel, 1937)	H			B				B	
Ophonus similis (Dejean, 1829)	B	X						B	
Ophonus subquadratus (Dejean, 1829)	H	X						B	
Parophonus hespericus Jeanne, 1985	N			N				N	
Parophonus hispanus (Rambur, 1838)		X	N	N			B	B	
Parophonus maculicornis (Duftschmid, 1812)	H	N		B		X	B	B	
Parophonus mendax (P. Rossi, 1790)	H	X	X				B		
Parophonus planicollis (Dejean, 1829)	H	X						B	
Trichotichnus nitens (Heer, 1837)		X	N	B	B	X	X	B	
Stenolophina Kirby, 1837 Jäger & Kataev in Cat. Pal. Col., vol. 1, 2017									
Acupalpus brunnipes (Sturm, 1825)		N						B	
Acupalpus dubius Schilsky, 1888			X					N	
Acupalpus elegans (Dejean, 1829)	H	X			N	N		N	
Acupalpus exiguus Dejean, 1829	X		X	N	N	N		N	
Acupalpus interstitialis Reitter, 1884								N	
Acupalpus luteatus (Duftschmid, 1812)	X	N	X						
Acupalpus maculatus (Schaum, 1860)	X	X	X	B	N	N	X	N	
Acupalpus mediterraneus Csiki, 1932					B				
Acupalpus meridianus (Linnaeus, 1760)	H	X	X		B	N	X	B	
Acupalpus notatus Mulsant & Rey, 1861	X	X			N	N	X	B	
Acupalpus parvulus (Sturm, 1825)						X	X	B	
Acupalpus puncticollis (Coquerel, 1859)	X				N				
Anthracus consputus (Duftschmid, 1812)						B		B	
Anthracus quarnerensis (Reitter, 1884)	H	X							
Anthracus transversalis (Schaum, 1862)								B	
Bradycellus caucasicus (Chaudoir, 1846)							X	B	
Bradycellus lusitanicus (Dejean, 1829)			N					B	
Bradycellus verbasci (Duftschmid, 1812)	X	B	X		B	N		B	
Dicheirotrichus chloroticus (Dejean, 1829)							B	B	
Stenolophus abdominalis persicus Mannerheim, 1844		N	X		N	X		B	
Stenolophus discophorus (Fischer von Waldheim, 1823)		X	X		N				
Stenolophus marginatus Dejean, 1829		X			N	X		B	
Stenolophus mixtus (Herbst, 1784)	H	N	X	B	N	N		N	
Stenolophus proximus Dejean, 1829	X	X	X						
Stenolophus skrimshiranus Stephens, 1828	X	X	X					N	
Stenolophus teutonus (Schrank, 1781)	H	X		B	N	X	X	B	

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Lebiini Bonelli, 1810 **Apenina** G.E. Ball, 1983 Kabak in Cat. Pal. Col., vol. 1, 2017									
Platytarus faminii faminii (Dejean, 1826)		X							
Cymindidina Laporte, 1834									
Cymindis axillaris axillaris (Fabricius, 1794)	H				B	X	X	B	
Cymindis etrusca etrusca Bassi, 1834				N		X	X	N	
Cymindis humeralis (Geoffroy, 1785)				B	N				
Cymindis miliaris (Fabricius, 1801)	H			B		B	X	B	
Pseudomasoreus canigoulensis (Fairmaire & Laboulbène, 1854)	H	N					B	B	
Demetriadina Bates, 1886									
Demetrias atricapillus (Linnaeus, 1758)	H	X	X	N	N	X	X	B	
Demetrias imperialis (Germar, 1823)		X							
Dromiusina Bonelli, 1810									
Apristus europaeus Mateu, 1980					N			N	
Apristus reticulatus Schaum, 1857		X							
Apristus subaeneus Chaudoir, 1846								B	
Calodromius spilotus (Illiger, 1798)		N			N		X		
Dromius agilis (Fabricius, 1787)				N	N	X	X		
Dromius fenestratus (Fabricius, 1794)					N	N			
Dromius meridionalis Dejean, 1825		X							
Dromius quadrimaculatus (Linnaeus, 1758)	X		X		N	X	X	N	
Lionychus maritimus Fairmaire, 1862								N	
Lionychus quadrillum (Duftschmid, 1812)				B	N	X	X	B	
Metadromius nanus (A. Fiori, 1914) [E]		N	X				B		
Microlestes abeillei abeillei (C.N.F. Brisout de Barneville, 1885)	H								
Microlestes corticalis (L. Dufour, 1820)		N	X					N	
Microlestes fissuralis (Reitter, 1901)	H	N	X	N	N	N	B	B	
Microlestes fulvibasis (Reitter, 1901)	H	X	X	N	N			B	
Microlestes levipennis levipennis P.H. Lucas, 1846				N			X	B	
Microlestes luctuosus luctuosus Holdhaus, 1904	H	X	X	N	B	N	X	B	
Microlestes mauritanicus (P.H. Lucas, 1846)			X						
Microlestes maurus maurus (Sturm, 1827)	X	X		N	B	X	X	N	
Microlestes minutulus (Goeze, 1777)		N	X	B					
Microlestes negrita negrita (Wollaston, 1854)	H	X		N				N	
Microlestes plagiatus (Duftschmid, 1812)		X		N				N	
Paradromius linearis (A.G. Olivier, 1795)	H	X	X	B	B	X	X	B	
Paradromius longiceps (Dejean, 1826)	N	B							
Philorhizus crucifer confusus Sciaky, 1991	B		X	B	B				
Philorhizus crucifer crucifer (P.H. Lucas, 1846)						X	X	B	
Philorhizus melanocephalus (Dejean, 1825)	H	X	X	B	N	X	X	B	
Philorhizus quadrisignatus (Dejean, 1825)		B				X		B	
Syntomus foveatus (Geoffroy, 1785)					B				
Syntomus impressus impressus (Dejean, 1825)	X	N					B	B	
Syntomus obscuroguttatus (Duftschmid, 1812)	X	X	X	N	N	N	B	B	
Syntomus silensis (A. Fiori, 1899) [E]							X	B	
Syntomus truncatellus (Linnaeus, 1760)					B				
Lebiina Bonelli, 1810									
Lebia cruxminor cruxminor (Linnaeus, 1758)	H		X		B	X	X	B	
Lebia cyanocephala cyanocephala (Linnaeus, 1758)	H	X	X	B	N	X	X	B	
Lebia fulvicollis thoracica Hoppe & Hornschuh, 1825		X					B	B	
Lebia humeralis Dejean, 1825	H	X		N	N	X	X	N	

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Lebia lepida Brullé, 1834		X							
Lebia marginata (Geoffroy, 1785)				N	N	X	X	B	
Lebia scapularis scapularis (Geoffroy, 1785)	X	X			B	X	X	B	
Lebia trimaculata (Villers, 1789)	H					X	X		
Licinini Bonelli, 1810 **Licinina** Bonelli, 1810 Huber & Marggi in Cat. Pal. Col., vol. 1, 2017									
Badister bullatus (Schrank, 1798)						N	B		
Badister collaris Motschulsky, 1844					N				
Badister meridionalis Puel, 1925	B		X			B			
Licinus cassideus cassideus (Fabricius, 1792)	H					X			
Licinus italicus Puel, 1925 [E]					B	X			
Licinus punctatulus granulatus Dejean, 1826								B	
Licinus silphoides (P. Rossi, 1790)	B	X		B	N	X	B	B	
Masoreini Chaudoir, 1871 Bousquet in Cat. Pal. Col., vol. 1, 2017									
Masoreus wetterhallii wetterhallii (Gyllenhal, 1813)	X						B	B	
Odacanthini Laporte, 1834 Bousquet in Cat. Pal. Col., vol. 1, 2017									
Odacantha melanura (Linnaeus, 1766)		X							
Oodini LaFerté-Sénectère, 1851 Bousquet in Cat. Pal. Col., vol. 1, 2017									
Oodes gracilis A. Villa & G. B. Villa, 1833	X	X							
Oodes helopioides helopioides (Fabricius, 1792)		N							
Panagaeini Bonelli, 1810 Häckel & Kirschenhofer in Cat. Pal. Col., vol. 1, 2017									
Panagaeus bipustulatus (Fabricius, 1775)	H					X		B	
Panagaeus cruxmajor (Linnaeus, 1758)		X	X						
Platynini Bonelli, 1810 Schmidt in Cat. Pal. Col., vol. 1, 2017									
Agonum duftschmidi J. Schmidt, 1994		X	X	B	N		X		
Agonum emarginatum (Gyllenhal, 1827)				N	N				
Agonum longicorne Chaudoir, 1846	X			N					
Agonum lugens (Duftschmid, 1812)		N	X			N	X		
Agonum marginatum (Linnaeus, 1758)	X	X		N		X	X	N	
Agonum muelleri (Herbst, 1784)				B	N	X	X		
Agonum nigrum Dejean, 1828	X	X	X				X	B	
Agonum numidicum (P.H. Lucas, 1846)	X	X						N	
Agonum permoestum Puel, 1938		N		N	N	N	B		
Agonum sexpunctatum (Linnaeus, 1758)							X		
Agonum sordidum Dejean, 1828	H	B			N			B	
Agonum thoreyi Dejean, 1828		X			N			N	
Agonum tulliae Mazzei & Brandmayr, 2017							B		
Agonum versutum Sturm, 1824				N	N	B			
Agonum viridicupreum viridicupreum (Goeze, 1777)	X			B	B	X	X		
Anchomenus dorsalis dorsalis (Pontoppidan, 1763)	H		X	B	N	X	X	B	
Atranus ruficollis (Gautier des Cottes, 1858)		X							
Limodromus assimilis (Paykull, 1790)							X		
Olisthopus fuscatus Dejean, 1828	H	X		N	N			B	
Olisthopus glabricollis (Germar, 1817)	H					X			
Oxypselaphus obscurus (Herbst, 1784)			X						
Paranchus albipes (Fabricius, 1796)	X	X	N	N	N	X	X	B	

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Pterostichini Bonelli, 1810 Bousquet in Cat. Pal. Col., vol. 1, 2017									
Abax parallelepipedus curtulus (Fairmaire, 1856) [E]	X	X		B	B	X	X	B	
Pedius inquinatus (Sturm, 1824)		X							
Percus bilineatus (Dejean, 1828) [E]	H	X		CK	B	X	X	N	
Poecilus cupreus cupreus (Linnaeus, 1758)	H	X	B	B	N	X	X	B	
Poecilus cursorius cursorius (Dejean, 1828)	H	X							
Poecilus gisellae gisellae (Csiki, 1930)								B	
Poecilus koyi viaticus (Dejean, 1828)						CK			
Poecilus nitidus (Dejean, 1828)	H	B							
Poecilus pantanellii (A. Fiori, 1903) [E]		B		B			B	B	
Poecilus versicolor (Sturm, 1824)			N	N					
Pterostichus anthracinus biimpressus (Küster, 1853)		X				N			
Pterostichus apenninus (Dejean, 1831)	X	X		N	N	X	X	B	
Pterostichus cursor (Dejean, 1828)	H	X	X	B	N	N			
Pterostichus dubius amorei Ganglbauer, 1907 [E]				N	N	X	X		
Pterostichus elongatus (Duftschmid, 1812)	H	N							
Pterostichus focarilei Casale & Giachino, 1985 [E]					B	X			
Pterostichus gracilis giordanii Bucciarelli & Sopracordevole, 1958	H	X	X						
Pterostichus impressicollis (Fairmaire & Laboulbène, 1854)					B		X		
Pterostichus macer macer (Marsham, 1802)				B					
Pterostichus melas italicus (Dejean, 1828)	H	X	X	B	B	X	X	B	
Pterostichus micans Heer, 1838				B	B	X			
Pterostichus niger niger (Schaller, 1783)	H	X		N	N	X	X	B	
Pterostichus nigrita nigrita (Paykull, 1790)	X	X	X	B	B	X	X	B	
Pterostichus ovoideus mainardii Straneo, 1934 [E]						B			
Pterostichus quadrifoveolatus Letzner, 1852						X	X	B	
Pterostichus ruffoi Sciaky, 1984 [E]							X	B	
Pterostichus strenuus (Panzer, 1797)				N	N	X	X		
Pterostichus vernalis (Panzer, 1796)		N	X		N		CK	N	
Stomis pumicatus pumicatus (Panzer, 1796)	H		X		B	X		B	
Sphodrini Laporte, 1834 **Atranopsina** Baehr, 1982 Hovorka in Cat. Pal. Col., vol. 1, 2017									
Platyderus neapolitanus (Reiche, 1855) [E]	H	X		B	B	X	X	B	
Platyderus paganettii Guéorguiev, 2009 [E]								B	
Platyderus vignai Guéorguiev, 2009 [E]	B							N	
Calathina Laporte, 1834 Hovorka in Cat. Pal. Col., vol. 1, 2017									
Calathus ambiguus ambiguus (Paykull, 1790)		N							
Calathus cinctus Motschulsky, 1850	B	X		B	N	X	X	B	
Calathus circumseptus Germar, 1823	H	X							
Calathus erratus erratus (C.R. Sahlberg, 1827)					N				
Calathus focarilei Schatzmayr, 1947 [E]					N				
Calathus fracassii fracassii Heyden, 1908 [E]				B	B	X	X	B	
Calathus fuscipes punctipennis Germar, 1823	H	X	X	B	N	X	X	B	
Calathus melanocephalus melanocephalus (Linnaeus, 1758)	H			N	B	X	X	N	
Calathus micropterus (Duftschmid, 1812)				B			B	B	
Calathus montivagus Dejean, 1831 [E]	H	X		N	B	X	X	B	
Calathus pirazzolii Putzeys, 1873 [E]						N			
Calathus rotundicollis Dejean, 1828	H	X	X	B	B	X	X	B	
Calathus sirentensis D'Amore Fracassi, 1908 [E]					B	X	X		

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Sphodrina Laporte, 1834 Casale in Cat. Pal. Col., vol. 1, 2017									
Laemostenus acutangulus (L.W. Schaufuss, 1862) [E]					B	B			
Laemostenus algerinus algerinus (Gory, 1833)								B	
Laemostenus barbarus (P.H. Lucas, 1846)								B	
Laemostenus cimmerius cimmerius (Fischer von Waldheim, 1823)	H	B		B	N	N	B		
Laemostenus complanatus (Dejean, 1828)								B	
Laemostenus venustus (Dejean, 1828)	B	X				X	X		
Sphodrus leucophthalmus (Linnaeus, 1758)	X							B	
Synuchina Lindroth, 1956 Hovorka in Cat. Pal. Col., vol. 1, 2017									
Synuchus vivalis vivalis (Illiger, 1798)	X					X	X	!	
Zabrini Bonelli, 1810 **Amarina** C. Zimmermann, 1832 Hieke in Cat. Pal. Col., vol. 1, 2017									
Amara aenea (DeGeer, 1774)	H	X		B	B	X	X	B	
Amara anthobia A. Villa & G.B. Villa, 1833	H	X		B	N	X	X	B	
Amara apricaria (Paykull, 1790)	H	N	X	B	N	X	B	B	
Amara aulica (Panzer, 1796)					B	X	B		
Amara concinna C. Zimmermann, 1832					B				
Amara consularis (Duftschmid, 1812)	H								
Amara cursitans C. Zimmermann, 1832		N							
Amara curta Dejean, 1828					B			B	
Amara eurynota (Panzer, 1796)	H	X		B	B	X	X	B	
Amara famelica C. Zimmermann, 1832					B			B	
Amara familiaris (Duftschmid, 1812)	X	X		B	N	X	X	B	
Amara fulvipes (Audinet-Serville, 1821)							X		
Amara kulti Fassati, 1947								B	
Amara lucida (Duftschmid, 1812)	H			B		X			
Amara lunicollis Schiödte, 1837							X		
Amara montana Dejean, 1828		X			N			B	
Amara nitida Sturm, 1825					N		X		
Amara ovata (Fabricius, 1792)	H	X		B	B	X		B	
Amara praetermissa (C.R. Sahlberg, 1827)						X			
Amara rufipes Dejean, 1828	B						X		
Amara sicula Dejean, 1831 [E]	X				B	X	X	B	
Amara similata (Gyllenhal, 1810)	X	X					X	N	
Zabrina Bonelli, 1810 Serrano & Andújar in Cat. Pal. Col., vol. 1, 2017									
Zabrus costae Heyden, 1891 [E]				N	B	X			
Zabrus ignavus ignavus Csiki, 1907				B					
Zabrus orsinii Dejean, 1831 [E]				N		X			
Zabrus tenebrioides tenebrioides (Goeze, 1777)	X	X				X			
Zuphiini Bonelli, 1810 **Zuphiina** Bonelli, 1810 Huber & Marggi in Cat. Pal. Col., vol. 1, 2017									
Parazuphium chevrolatii chevrolatii (Laporte, 1833)		B						B	
Polistichus connexus (Geoffroy, 1785)	H	X							
Zuphium olens (P. Rossi, 1790)	X	N						B	
HALIPLIDAE Aubé, 1836 van Vondel in Cat. Pal. Col., vol. 1, 2017									
Haliplus flavicollis Sturm, 1834		X					X		

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Haliplus guttatus Aubé, 1836	X	X			B		X	N	
Haliplus lineatocollis (Marsham, 1802)	H	X	X	B	B	N	X	B	
Haliplus mucronatus Stephens, 1828	H	X			B	B		N	
Haliplus obliquus (Fabricius, 1787)	H	X		N	B	X	X		
Haliplus ruficollis (DeGeer, 1774)	H	X	X	N	B	X	X		
Haliplus variegatus Sturm, 1834	X	X						N	
Peltodytes caesus (Duftschmid, 1805)	B	X		N				N	
Peltodytes rotundatus (Aubé, 1836)	X	X	X		B	N			
NOTERIDAE C.G. Thomson, 1860 **Noterinae** C.G. Thomson, 1860 **Noterini** C.G. Thomson, 1860 Hájek in Cat. Pal. Col., vol. 1, 2017									
Noterus clavicornis (DeGeer, 1774)	H	X	X	N	B	X	X	N	
Noterus crassicornis (O.F. Müller, 1776)		X					X		
HYGROBIIDAE Régimbart, 1879 Hájek in Cat. Pal. Col., vol. 1, 2017									
Hygrobia hermanni (Fabricius, 1775)	X	B			B	X			
DYTISCIDAE Leach, 1815 **Agabinae** J. Thomson, 1867 **Agabini** J. Thomson, 1867 Hájek in Cat. Pal. Col., vol. 1, 2017									
Agabus biguttatus (A.G. Olivier, 1795)	X	X			B	X	X	B	
Agabus bipustulatus (Linnaeus, 1767)	H	X	X	B	B	X	X	B	
Agabus brunneus (Fabricius, 1798)	H	X		B	B		X		
Agabus congener (Thunberg, 1794)							X		
Agabus conspersus (Marsham, 1802)	H	X			B		X	N	
Agabus didymus (A.G. Olivier, 1795)	H	X	X	N	B	X	X	B	
Agabus dilatatus (Brullé, 1832)					B			B	
Agabus guttatus guttatus (Paykull, 1798)					B	X	X	B	
Agabus nebulosus (Forster, 1771)	X	X	X	N	B	X	X	N	
Agabus paludosus (Fabricius, 1801)	X			N	B	X	X		
Ilybius ater (DeGeer, 1774)	X					X	X		
Ilybius chalconatus (Panzer, 1796)	B		X		B	X	X	B	
Ilybius fuliginosus fuliginosus (Fabricius, 1792)		X	X	N	B	X	X		
Ilybius lagabrunensis Schizzerotto & Fery, 1990 [E]					B	B			
Ilybius pederzanii Fery & Nilsson, 1993 [E]		B	N		B			B	
Ilybius pseudoneglectus Franciscolo, 1972	B	B							
Ilybius quadriguttatus Lacordaire, 1835		X							
Colymbetinae Erichson, 1837 **Colymbetini** Erichson, 1837									
Colymbetes fuscus (Linnaeus, 1758)	H	X	X	N	B	X	X	N	
Meladema coriacea Laporte, 1835	N				B		X	B	
Melanodytes pustulatus (P. Rossi, 1792)		X						N	
Rhantus suturalis (W.S. Macleay, 1825)	X	X	X	B	B		X	B	
Copelatinae Branden, 1885 **Copelatini** Branden, 1885									
Liopterus haemorrhoidalis (Fabricius, 1787)		X	X					B	
Cybistrinae Sharp, 1880 **Cybistrini** Sharp, 1880									
Cybister lateralimarginalis lateralimarginalis (DeGeer, 1774)	H	X	X			N		N	

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Cybister tripunctatus africanus Laporte, 1834		X				B		B	
Dytiscinae Leach, 1815									
Aciliini J. Thomson, 1867									
Acilius sulcatus (Linnaeus, 1758)	X			N	B	X		B	
Graphoderus cinereus (Linnaeus, 1758)					B				
Dytiscini Leach, 1815									
Dytiscus circumflexus Fabricius, 1801	X	X			B		X	B	
Dytiscus marginalis marginalis Linnaeus, 1758			X	B	B	X	X	N	
Dytiscus mutinensis Branden, 1885		X							
Eretini Crotch, 1873									
Eretes griseus (Fabricius, 1781)								B	
Hydaticini Sharp, 1882									
Hydaticus leander (P. Rossi, 1790)	X	X						N	
Hydaticus seminiger (DeGeer, 1774)		X							
Hydroporinae Aubé, 1836									
Bidessini Sharp, 1882									
Bidessus calabricus Guignot, 1957	X	X			B	X		B	
Bidessus delicatulus (Schaum, 1844)			X		B	N		B	
Bidessus goudotii (Laporte, 1835)								B	
Bidessus muelleri Zimmermann, 1927		X							
Bidessus pumilus (Aubé, 1838)		X							
Bidessus unistriatus (Goeze, 1777)						N			
Hydroglyphus geminus (Fabricius, 1792)	H	X	X	N	B	X	X	B	
Hydroglyphus signatellus (Klug, 1834)	H							B	
Yola bicarinata bicarinata (Latreille, 1804)	X	X			B			N	
Hydroporini Aubé, 1836									
Deronectina Galewski, 1994									
Boreonectes griseostriatus griseostriatus (DeGeer, 1774)					B	X	X		
Deronectes angelinii Fery & Brancucci, 1997 [E]							B		
Deronectes aubei aubei (Mulsant, 1843)								B	
Deronectes moestus inconspectus (Leprieur, 1876)	B				B	X	X	B	
Deronectes semirufus (Germar, 1844)					B	B	B	B	
Nebrioporus canaliculatus (Lacordaire, 1835)		X			B	B	B		
Nebrioporus ceresyi (Aubé, 1838)	B	X						N	
Nebrioporus fenestratus (Germar, 1838) [E]								B	
Nebrioporus luctuosus (Aubé, 1838)		X			B	B	X		
Nebrioporus sansii (Aubé, 1838)		X			B	X		B	
Nectoporus sanmarkii sanmarkii (C.R. Sahlberg, 1826)							X		
Oreodytes meridionalis Binaghi & Sanfilippo, 1971 [E]							X		
Scarodytes halensis (Fabricius, 1787)	X	B	X		B	X	B	B	
Scarodytes pederzanii Angelini, 1973						B	X		
Scarodytes ruffoi Franciscolo, 1961 [E]					B	X			
Stictotarsus procerus (Aubé, 1838)					B				
Hydroporina Aubé, 1836									
Graptodytes bilineatus (Sturm, 1835)		X							
Graptodytes flavipes (A.G. Olivier, 1795)	X				N	X	X		
Graptodytes fractus (Sharp, 1882)					B	B			
Graptodytes ignotus (Mulsant & Rey, 1861)								B	
Graptodytes varius (Aubé, 1838)		X			B	X	B	B	
Graptodytes veterator veterator (Zimmermann, 1918)		X	X					B	
Hydroporus analis Aubé, 1838					B	X	X		
Hydroporus apenninus Pederzani & Rocchi, 2005 [E]						B			

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Hydroporus discretus discretus Fairmaire & C.N.F. Brisout, 1859					B	X	X	B	
Hydroporus jonicus jonicus L. Miller, 1862	H	X							
Hydroporus limbatus Aubé, 1838	X							B	
Hydroporus marginatus (Duftschmid, 1805)					B			B	
Hydroporus memnonius Nicolai, 1822	H	X	X		B	X	X	N	
Hydroporus nigrita (Fabricius, 1792)					B	X	X		
Hydroporus obsoletus Aubé, 1838					B	X	X	B	
Hydroporus palustris (Linnaeus, 1760)			X		B	X	X		
Hydroporus planus (Fabricius, 1782)	X	X			B	X		B	
Hydroporus pubescens (Gyllenhal, 1808)	X	X	X	N	B	X	X	B	
Hydroporus tessellatus (Drapiez, 1819)	X	X	X	N	B	X	X	B	
Porhydrus lineatus (Fabricius, 1775)		X				X		B	
Porhydrus obliquesignatus (Bielz, 1852)	B				B		X		
Stictonectes optatus (Seidlitz, 1887)					B			B	
Hydrovatini Sharp, 1880									
Hydrovatus cuspidatus (Kunze, 1818)	H	X						B	
Hygrotini Portevin, 1929									
Hygrotus confluens (Fabricius, 1787)	X	X			B			N	
Hygrotus impressopunctatus (Schaller, 1783)		N							
Hygrotus inaequalis (Fabricius, 1777)	B	X	X	N	B	X	X	N	
Hygrotus parallellogrammus (Ahrens, 1812)	B	X							
Hyphydrini Gistel, 1848									
Hyphydrus anatolicus Guignot, 1957		X							
Hyphydrus aubei Ganglbauer, 1891	B	X	X		B		X	N	
Laccophilinae Gistel, 1848									
Laccophilini Gistel, 1848									
Laccophilus hyalinus (DeGeer, 1774)	X	X	N		B		B	B	
Laccophilus minutus (Linnaeus, 1758)	X	X	X	B		X	X	N	
Laccophilus poecilus Klug, 1834	H	X		B		N	N	N	
POLYPHAGA Emery, 1886									
STAPHYLINIFORMIA Lameere, 1900									
HYDROPHILOIDEA Latreille, 1802									
HYDROPHILIDAE Latreille, 1802									
Hydrophilinae Latreille, 1802									
Berosini Mulsant, 1844									
Prokin, Przewoźny & Ryndevich in Cat. Pal. Col., vol. 2, 2015									
Berosus affinis Brullé, 1835	H	X	X	N	CK	N		B	
Berosus hispanicus Küster, 1847	X	X						B	
Berosus jaechi Schödl, 1991	B	X							
Berosus luridus (Linnaeus, 1760)		X				N			
Berosus signaticollis (Charpentier, 1825)	X	X				X	X		
Laccobiini Houlbert, 1922									
Laccobius albescens Rottenberg, 1874		B		B		N	X	B	
Laccobius alternus Motschulsky, 1855		X			CK		X	B	
Laccobius bipunctatus (Fabricius, 1775)	H						X		
Laccobius gracilis gracilis Motschulsky, 1855		X				CK	X	B	
Laccobius minutus (Linnaeus, 1758)				B			X		
Laccobius neapolitanus Rottenberg, 1874		X		N	CK	X	X	B	
Laccobius obscuratus Rottenberg, 1874	X				B	X	X	B	
Laccobius revelierei Perris, 1864		N					X		
Laccobius simulatrix d'Orchymont, 1932		X			CK		X	B	

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Laccobius sinuatus sinuatus Motschulsky, 1849			X						
Paracymus aeneus (Germar, 1824)	H	X						CK	
Paracymus scutellaris (Rosenhauer, 1856)		X							
Hydrobiusini Mulsant, 1844									
Hydrobius fuscipes (Linnaeus, 1758)		X	X			X	X		
Limnoxenus niger (Gmelin, 1790)		X	X	N		N			
Hydrophilini Latreille, 1802									
Hydrochara caraboides (Linnaeus, 1758)	N	X	X		CK	N			
Hydrophilus piceus (Linnaeus, 1758)	H	X	X					N	
Chaetarthriinae Bedel, 1881									
Anacaenini M. Hansen, 1991									
Anacaena bipustulata (Marsham, 1802)		X		N		X	X	B	
Anacaena globulus (Paykull, 1798)				N		X	X	N	
Anacaena limbata (Fabricius, 1792)	X	X	X	N	N	X	X	N	
Chaetarthria seminulum (Herbst, 1797)								N	
Enochrinae Short & Fikáček, 2013									
Cymbiodyta marginella (Fabricius, 1792)		X							
Enochrus affinis (Thunberg, 1794)				N					
Enochrus ater (Kuwert, 1888)								B	
Enochrus bicolor (Fabricius, 1792)	H	X	X					CK	
Enochrus calabricus Ferro, 1986 [E]							X		
Enochrus fuscipennis (C.G. Thomson, 1884)							X		
Enochrus halophilus (Bedel, 1879)	H	B							
Enochrus melanocephalus (A.G. Olivier, 1793)		X							
Enochrus ochropterus (Marsham, 1802)						B			
Enochrus politus (Küster, 1849)		X						B	
Enochrus quadripunctatus (Herbst, 1797)		X	X		N	X	X		
Enochrus testaceus (Fabricius, 1801)	H		X						
Acidocerinae Zaitzev, 1908									
Chasmogenus livornicus (Kuwert, 1890)		X							
Helochares lividus (Forster, 1771)	X	X	X	B	N	X	X	CK	
Helochares obscurus (O.F. Müller, 1776)			X		CK				
Sphaeridiinae Latreille, 1802									
Coelostomatini L. Heyden, 1891									
Coelostoma hispanicum (Küster, 1848)	N	X	N		N			CK	
Coelostoma orbiculare (Fabricius, 1775)		X	X	N		X	X	N	
Dactylosternum abdominale (Fabricius, 1792)						N		N	
Megasternini Mulsant, 1844									
Cercyon granarius Erichson, 1837								N	
Cercyon haemorrhoidalis (Fabricius, 1775)	H	X	X	N	N	X	X	CK	
Cercyon impressus (Sturm, 1807)			X						
Cercyon laminatus Sharp, 1873			X						
Cercyon marinus C.G. Thomson, 1853								CK	
Cercyon nigriceps (Marsham, 1802)						N	X	N	
Cercyon obsoletus (Gyllenhal, 1808)	H	X					X		
Cercyon pygmaeus (Illiger, 1801)		X	X		N	N		N	
Cercyon quisquilius (Linnaeus, 1760)		X	X	N	N	X	X	CK	
Cercyon subsulcatus Rey, 1885								CK	
Cercyon terminatus (Marsham, 1802)		X							
Cercyon tristis (Illiger, 1801)	H			N			X	N	
Cercyon unipunctatus (Linnaeus, 1758)						X			
Cercyon ustulatus (Preyssler, 1790)						B			

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Cryptopleurum crenatum (Kugelann, 1794)			X						
Cryptopleurum minutum (Fabricius, 1775)	X	X	X	N	N	X	X	CK	
Cryptopleurum subtile Sharp, 1884			CK						
Megasternum concinnum (Marsham, 1802)	H	B	X	N	CK	X	X	CK	
Sphaeridiini Latreille, 1802									
Sphaeridium bipustulatum Fabricius, 1781	H	X	X		N	X	X	CK	
Sphaeridium lunatum Fabricius, 1792	X	N				CK	CK	CK	
Sphaeridium scarabaeoides (Linnaeus, 1758)	H	X	X	N	N	X	X	CK	
Sphaeridium substriatum Faldermann, 1838	B	X	X	N	N	X	X		
HELOPHORIDAE Leach, 1815 Fikáček, Angus, Gentili, Jia & Minoshima in Cat. Pal. Col., vol. 2, 2015									
Helophorus aequalis J. Thomson, 1868							B		
Helophorus alternans Gené, 1836	H	CK		N	N			CK	
Helophorus aquaticus (Linnaeus, 1758)	H	X	N	N	B	X	X	N	
Helophorus asperatus Rey, 1885						X			
Helophorus brevipalpis brevipalpis Bedel, 1881	H	X	X	N	N	X	X	N	
Helophorus discrepans Rey, 1885						X	B		
Helophorus dorsalis (Marsham, 1802)	H	X	X			N			
Helophorus flavipes Fabricius, 1792	CK	X	X	N	N	X	X	CK	
Helophorus fulgidicollis Motschulsky, 1860	B								
Helophorus glacialis A. Villa & G.B. Villa, 1833						X			
Helophorus granularis (Linnaeus, 1760)	X	CK				X	X		
Helophorus griseus Herbst, 1793	CK					X			
Helophorus illustris Sharp, 1916	CK	X							
Helophorus longitarsis Wollaston, 1864	X	B				X	X		
Helophorus milleri Kuwert, 1886	CK	X	X	N		X	X	CK	
Helophorus minutus Fabricius, 1775		CK		N		X	X		
Helophorus porculus Bedel, 1881		N	X					!	
Helophorus rufipes (Bosc, 1791)	H	CK		N		X			
HYDROCHIDAE C.G. Thomson, 1859 Fikáček, Angus, Gentili, Jia & Minoshima in Cat. Pal. Col., vol. 2, 2015									
Hydrochus angustatus Germar, 1824		X				X			
Hydrochus flavipennis Küster, 1852	CK	B	X	N	N	X	X	N	
Hydrochus grandicollis Kiesenwetter, 1870						X	X		
GEORISSIDAE Laporte, 1840 Fikáček & Przewożny in Cat. Pal. Col., vol. 2, 2015									
Georissus costatus Laporte, 1840						B		CK	
Georissus crenulatus (P. Rossi, 1794)		X			CK			CK	
Georissus laesicollis Germar, 1832		CK				B		CK	
HISTERIDAE Gyllenhal, 1808 **Abraeinae** W.S. Macleay, 1819 **Abraeini** W.S. Macleay, 1819 Lackner, Mazur & Newton in Cat. Pal. Col., vol. 2, 2015									
Abraeus granulum Erichson, 1839	CK				CK	X		CK	LC
Abraeus perpusillus (Marsham, 1802)	B	X		N	CK	X		CK	LC
Chaetabraeus globulus (Creutzer, 1799)	H	X			N				
Chaetabraeus lucidus (Peyerimhoff, 1917)						N		B	
Acritini Wenzel, 1944									
Acritus homoeopathicus Wollaston, 1857	H							CK	NT
Acritus italicus Reitter, 1904	H	CK	X	CK	CK	CK	X	B	
Acritus minutus (Herbst, 1791)	H	CK			CK				

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Acritus nigricornis (Hoffmann, 1803)	X	CK		N		CK	X	CK	
Aeletes atomarius (Aubé, 1842)		X		CK		CK		CK	LC
Halacritus punctum (Aubé, 1842)	CK			CK					LC
Plegaderini Portevin, 1929									
Eubrachium hispidulum (Bremi-Wolf, 1855)	B				CK				
Plegaderus dissectus Erichson, 1839	X	X			CK	X	CK	CK	LC
Plegaderus otti Marseul, 1856	X	X			N		X		VU
Plegaderus sanatus gobanzi G. Müller, 1903							CK		CR
Plegaderus saucius Erichson, 1834							X	CK	VU
Dendrophilinae Reitter, 1909									
Anapleini Olexa, 1982									
Bacaninus consobrinus (Aubé, 1850)						CK			CR
Dendrophilini Reitter, 1909									
Dendrophilus punctatus punctatus (Herbst, 1791)		CK						B	LC
Kissister minimus (Laporte, 1840)	H	X	X	N	CK	X	X	CK	
Paromalini Reitter, 1909									
Carcinops pumilio (Erichson, 1834)	X	X			N	X	X		
Paromalus filum Reitter, 1884	CK	CK			CK	CK			VU
Paromalus flavicornis (Herbst, 1791)	H	X	X	N	CK	X	X	B	LC
Paromalus parallelepipedus (Herbst, 1791)	CK	CK		N	CK	X	X	CK	LC
Platylomalus complanatus (Panzer, 1797)	CK	X			B	X	X	B	LC
Haeteriinae Marseul, 1857									
Haetaerius ferrugineus (A.G. Olivier, 1789)	H			CK	CK	X	X		
Histerinae Gyllenhal, 1808									
Histerini Gyllenhal, 1808									
Atholus bimaculatus (Linnaeus, 1758)	H	X		N	CK		CK	CK	
Atholus corvinus (Germar, 1817)	X						X		
Atholus duodecimstriatus duodecimstriatus (Schrank, 1781)	H	X	X	N	CK	X	X	B	
Atholus scutellaris (Erichson, 1834)	B								
Atholus siculus (Tournier, 1869)	CK								
Hister bissexstriatus Fabricius, 1801					B			CK	
Hister capsirensis Auzat, 1922					CK		X	CK	
Hister funestes Erichson, 1834	CK						CK		
Hister helluo Truqui, 1852		X				CK		B	
Hister illigeri illigeri Duftschmid, 1805	H	X	X	N	CK	X	X	B	
Hister lugubris Truqui, 1852			CK						
Hister mediterraneus Lundgren, 1991	N								
Hister moerens Erichson, 1834	B				CK	CK		CK	
Hister quadrimaculatus Linnaeus, 1758	H	X	X	N	CK	X	X	CK	
Hister quadrinotatus quadrinotatus L.G. Scriba, 1790	H								
Hister teter Truqui, 1852	X	CK		CK	CK	X	X		
Hister unicolor unicolor Linnaeus, 1758	X	X			CK	CK	X	CK	
Margarinotus brunneus (Fabricius, 1775)	X	X	X		CK		CK	CK	
Margarinotus carbonarius carbonarius (Hoffmann, 1803)	X					X		B	
Margarinotus ignobilis (Marseul, 1854)	X	B			N	X			
Margarinotus merdarius (Hoffmann, 1803)						CK			LC
Margarinotus neglectus (Germar, 1813)	X				CK	X	X	CK	
Margarinotus obscurus (Kugelann, 1792)	H			B	CK		X	CK	
Margarinotus punctiventer (Marseul, 1854)	X			CK	CK	X	X	CK	
Margarinotus purpurascens (Herbst, 1791)	H	X		CK	CK	X			
Margarinotus striola succicola (C.G. Thomson, 1862)					CK	X	X	B	NT
Margarinotus ventralis (Marseul, 1854)	B			N	CK	X	X	CK	

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Merohister ariasi (Marseul, 1864)	CK				CK				EN
Pachylister inaequalis (A.G. Olivier, 1789)	X	CK		N	CK	X	X	CK	
Pactolinus major (Linnaeus, 1767)	X	X						B	
Platysomatini Bickhardt, 1914									
Eurosomides minor (P. Rossi, 1792)	H	X			CK	X	X		
Platysoma angustatum (Hoffmann, 1803)							CK		VU
Platysoma compressum (Herbst, 1783)	H				CK	X	CK	B	LC
Platysoma elongatum elongatum (Thunberg, 1787)	B	X		N		X	X	B	LC
Platysoma filiforme Erichson, 1834	X						X		NT
Platysoma lineare Erichson, 1834	CK						X	CK	VU
Onthophilinae W.S. Macleay, 1819									
Onthophilus affinis L. Redtenbacher, 1847	X								
Onthophilus punctatus cicatricosus Reitter, 1884		CK							
Onthophilus punctatus punctatus (O.F. Müller, 1776)	H	X			CK	N	X	CK	
Onthophilus striatus striatus (Forster, 1771)	H	X	X	CK	CK	X	B	B	
Saprininae C.É. Blanchard, 1845									
Chalcionellus aemulus (Illiger, 1807)	CK	X			CK			CK	
Chalcionellus decemstriatus decemstriatus (P. Rossi, 1792)	H	X	X		CK	CK	CK	B	
Gnathoncus buyssoni Auzat, 1917					CK			!	
Gnathoncus communis (Marseul, 1862)		CK			B	CK			
Gnathoncus nannetensis (Marseul, 1862)					CK	CK		B	
Gnathoncus rotundatus (Kugelann, 1792)		CK							LC
Hypocacculus metallescens (Erichson, 1834)	X							CK	
Hypocacculus spretulus (Erichson, 1834)								B	
Hypocaccus brasiliensis (Paykull, 1811)	X	X					X	CK	
Hypocaccus dimidiatus dimidiatus (Illiger, 1807)	X	X			CK			CK	
Hypocaccus rubripes (Erichson, 1834)	X	X							
Hypocaccus rugifrons (Paykull, 1798)	CK	X			CK	CK	X	CK	
Pholioxenus schatzmayri (G. Müller, 1910)	H								
Saprinus acuminatus acuminatus (Fabricius, 1798)	H	X			CK	CK	X	CK	
Saprinus aegialius Reitter, 1884	X	X		CK	CK	X	X	B	
Saprinus aeneus (Fabricius, 1775)							CK		
Saprinus caerulescens caerulescens (Hoffmann, 1803)	X	X			CK				
Saprinus calatravensis Fuente, 1899	CK	CK			CK	X	CK		
Saprinus chalcites (Illiger, 1807)	H	X			CK				
Saprinus detersus (Illiger, 1807)	CK	X		N	CK	X	X		
Saprinus furvus Erichson, 1834	CK	X		N	CK	X			
Saprinus georgicus Marseul, 1862	X	X						CK	
Saprinus godet (Brullé, 1832)	CK				CK				
Saprinus immundus (Gyllenhal, 1827)				CK		X?			
Saprinus lautus lautus Erichson, 1839					N	B			
Saprinus maculatus (P. Rossi, 1792)	B				CK				
Saprinus planiusculus Motschulsky, 1849					CK	N	CK		
Saprinus politus politus (Brahm, 1790)	H	X		N	CK	X	X	CK	
Saprinus semistriatus (L.G. Scriba, 1790	H				CK	X	X		
Saprinus subnitescens Bickhardt, 1909	X		X	N	CK	X	X	CK	
Saprinus tenuistrius sparsutus Solsky, 1876					CK	X	B		
Tribalinae Bickhardt, 1914									
Epierus comptus Erichson, 1834	H	X		N	CK	X	X	CK	LC
Pseudepierus italicus (Paykull, 1811)	X	X		N	CK	X	X	CK	LC
Tribalus scaphidiformis (Illiger, 1807)						CK		CK	

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STAPHYLINOIDEA Latreille, 1802									
HYDRAENIDAE Mulsant, 1844									
Hydraeninae Mulsant, 1844									
Hydraenini Mulsant, 1844									
Jäch & Skale in Cat. Pal. Col., vol. 2, 2015									
Hydraena alia d'Orchymont, 1934 [E]					CK		X		
Hydraena angulosa Mulsant, 1844					B				
Hydraena assimilis Rey, 1885						X	X	CK	
Hydraena devillei Ganglbauer, 1901					N	X	X	B	
Hydraena heterogyna Bedel, 1898				B	B				
Hydraena imperatrix Kniz, 1919 [E]					CK	X	X	B	
Hydraena minutissima Stephens, 1829						CK	CK	CK	
Hydraena pygmaea pygmaea G.R. Waterhouse, 1833							X	CK	
Hydraena sicula Kiesenwetter, 1849 [E]								B	
Hydraena similis d'Orchymont, 1930 [E]			X		CK	CK	X	B	
Hydraena solarii Pretner, 1930 [E]					B				
Hydraena sp.cfr. *sanfilippoi* Audisio & De Biase, 1995 [E]							!		
Hydraena spinipes Baudi di Selve, 1882 [E]				CK	CK	CK	X	N	
Hydraena subimpressa Rey, 1885			X		CK	CK	X	B	
Hydraena subirregularis Pic, 1918 [E]							X	B	
Hydraena truncata Rey, 1885			X		B	X	X	B	
Limnebiini Mulsant, 1844									
Limnebius calabricus Jäch, 1993 [E]	X					CK	X	CK	
Limnebius furcatus Baudi di Selve, 1872	X	X	N			X	X		
Limnebius nitiduloides Baudi di Selve, 1872					CK	X	X		
Limnebius nitidus (Marsham, 1802)						X			
Limnebius oblongus Rey, 1883					N				
Limnebius papposus Mulsant, 1844						X	X		
Limnebius perparvulus Rey, 1884								B	
Ochthebiinae C.G. Thomson, 1859									
Aulacochthebius exaratus Mulsant, 1844		N	X						
Ochthebius adriaticus adriaticus Reitter, 1886	B								
Ochthebius basilicatus A. Fiori, 1915 [E]					B			B	
Ochthebius brevicollis Baudi di Selve, 1864	B								
Ochthebius corcyraeus Jäch, 1990	B	CK		CK	B				
Ochthebius crenulatus Mulsant & Rey, 1850				N	B	CK		B	
Ochthebius dentifer Rey, 1885								B	
Ochthebius difficilis Mulsant, 1844		CK		N	CK	X	X	N	
Ochthebius dilatatus Stephens, 1829	H	X	X		N	CK		B	
Ochthebius gagliardii d'Orchymont, 1940 [E]		X							
Ochthebius impressipennis Rey, 1886	B				N				
Ochthebius lanuginosus Reiche & Saulcy, 1856	B								
Ochthebius latinorum (Ieniştea, 1988) [E]								B	
Ochthebius mediterraneus (Ieniştea, 1988)		N			B			B	
Ochthebius minimus (Fabricius, 1792)		X	X						
Ochthebius nobilis A. Villa & G.B. Villa, 1835	CK					CK		B	
Ochthebius opacus Baudi di Selve, 1882					B	N		B	
Ochthebius pilosus Waltl, 1835				N					
Ochthebius punctatus Stephens, 1829	H	X							
Ochthebius quadricollis Mulsant, 1844								B	
Ochthebius quadrifossulatus Waltl, 1835					B			B	

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Ochthebius ragusae Kuwert, 1887		X	X			X	X	B	
Ochthebius siculus Kuwert, 1887								CK	
Ochthebius subinteger Mulsant & Rey, 1861	CK								
Ochthebius subpictus subpictus Wollaston, 1857	CK								
Ochthebius tacapasensis tacapasensis Ferro, 1983								B	
Ochthebius urbanelliae Audisio, Trizzino & De Biase, 2010	B								
Ochthebius virgula Ferro, 1986 [E]	B					CK			
Ochthebius viridescens Ieniştea, 1988	CK								
Ochthebius viridis viridis Peyron, 1858		X	X						
PTILIIDAE Erichson, 1845 **Nossidiinae** Sörensson & Delgado, 2019 Sörenson in Cat. Pal. Col. Vol. 2, 2015; Sörenson & Delgado, 2019									
Nossidium flachi Ganglbauer, 1898	B				B				DD
Nossidium pilosellum (Marsham, 1802)	B	X		N	B	B	N	B	DD
Ptiliinae Erichson, 1845 **Actidiini** Portevin, 1929									
Actidium coarctatum (Haliday, 1855)		N							DD
Ptiliini Erichson, 1845									
Millidium minutissimum (Weber & Mohr, 1804)		X							
Ptiliola kunzei (Heer, 1841)	X	X						N	DD
Ptiliolum africanum Peyerimhoff, 1917				B	B			B	
Ptiliolum caledonicum (Sharp, 1871)	H								DD
Ptiliolum fuscum (Erichson, 1845)		X						N	DD
Ptiliolum hopffgarteni (Flach, 1888)				N	B			B	DD
Ptiliolum marginatum (Aubé, 1850)	X		X		B	X		N	DD
Ptiliolum oedipus (Flach, 1886)					B			B	DD
Ptiliolum schwarzi (Flach, 1887)				B	B	B		B	DD
Ptiliolum spencei (Allibert, 1844)				N	B				DD
Ptilium caesum Erichson, 1845	H								DD
Ptilium exaratum (Allibert, 1844)	X								DD
Ptilium tenue Kraatz, 1858	X		B						DD
Ptenidiini Flach, 1889									
Ptenidium brenskei Flach, 1887								B	DD
Ptenidium fuscicorne Erichson, 1845		B						B	DD
Ptenidium intermedium Wankowicz, 1869			B					B	DD
Ptenidium laevigatum Erichson, 1845	H	X			N	X	X	N	DD
Ptenidium longicorne Fuss, 1868								B	DD
Ptenidium nitidum (Heer, 1841)		X						B	DD
Ptenidium pusillum (Gyllenhal, 1808)	H	X	B	N		N	N	B	DD
Ptenidium turgidum C.G. Thomson, 1855	X	X				X		N	DD
Ptinellini Reitter, 1906									
Microptilium pulchellum (Allibert, 1844)			B						
Pteryx ganglbaueri Erichson, 1909 [E]								B	NT
Pteryx suturalis (Heer, 1841)	X			N	B	X	X	B	DD
Ptinella aptera (Guérin-Méneville, 1839)		X							DD
Ptinella denticollis (Fairmaire, 1858)					B				DD
Ptinella limbata (Heer, 1841)							X		DD
Ptinella mekura Kubota, 1943					B				DD
Acrotrichini Reitter, 1909 **Nephanina** Portevin, 1929									
Nephanes titan (Newman, 1834)	X	X				N			

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Acrotrichina Reitter, 1909									
Acrotrichis arnoldi Rosskothen, 1935								B	
Acrotrichis atomaria (DeGeer, 1774)	H	B	B	N	B	B	N	B	
Acrotrichis danica Sundt, 1958								B	
Acrotrichis dispar (A. Matthews, 1865)						B			
Acrotrichis fascicularis (Herbst, 1793)	B		X	B	B	B	N	B	
Acrotrichis grandicollis (Mannerheim, 1844)	B	X	X	B	B	B		N	
Acrotrichis intermedia (Gillmeister, 1845)	H	B	X	B	B	B	B	B	
Acrotrichis montandonii (Allibert, 1844)	X				B	X	X	B	
Acrotrichis pumila (Erichson, 1845)		N							
Acrotrichis rosskotheni Sundt, 1971	B	B		B	B	B	B	B	
Acrotrichis sericans (Heer, 1841)			X		B	N	N	N	
Acrotrichis sitkaensis (Motschulsky, 1845)					N	X			
Acrotrichis thoracica (Waltl, 1838)		B	X						
AGYRTIDAE C.G. Thomson, 1859 **Agyrtinae** C.G. Thomson, 1859 Růžička in Cat. Pal. Col., vol. 2, 2015									
Agyrtes bicolor Laporte, 1840						N		N	
LEIODIDAE Fleming, 1821 **Cholevinae** Kirby, 1837 **Anemadini** Hatch, 1928 **Anemadina** Hatch, 1928 Perreau in Cat. Pal. Col., vol. 2, 2015									
Anemadus acicularis (Kraatz, 1852)	H	X	CK	B	B	CK			
Anemadus italicus (Zoia, 1990) [E]		CK	X	B	B	B	B	B	
Anemadus strigosus strigosus (Kraatz, 1852)		X		CK	B	X	X	CK	
Speonemadus orchesioides (Fairmaire, 1879)			CK				B		
Cholevini Kirby, 1837 **Catopina** Chaudoir, 1845									
Catops coracinus Kellner, 1846	X	CK			CK				
Catops fuliginosus Erichson, 1837	CK			CK	CK	X	X	N	
Catops fuscus fuscoides Reitter, 1909	X	X			CK				
Catops grandicollis Erichson, 1837			CK	N	B	N			
Catops kirbyi kirbyi (Spence, 1815)				B	B	X	X	B	
Catops nigricans (Spence, 1813)	H		CK	N	CK	X	X	B	
Catops nigriclavis Gerhardt, 1900		N			B				
Catops nitidicollis Kraatz, 1856	X								
Catops picipes (Fabricius, 1787)				CK		N			
Catops subfuscus subfuscus Kellner, 1846			X	B	B	N		CK	
Catops tristis tristis (Panzer, 1794)			X	CK	CK	X	X	CK	
Catops ventricosus rotundatus Szymczakowski, 1963					CK			CK	
Dreposcia umbrina (Erichson, 1837)					CK	CK			
Sciodrepoides watsoni watsoni (Spence, 1815)	X	X		B	B	X	X	B	
Cholevina Kirby, 1837									
Catopsimorphus orientalis orientalis Aubé, 1850	H	X		CK				N	
Choleva cisteloides cisteloides (Frölich, 1799)	H			CK	CK	X	X	CK	
Choleva garganona Reitter, 1913 [E]	X			CK	CK	CK		CK	
Choleva oblonga menozzii Jeannel, 1923 [E]	H					CK			
Choleva reitteri Petri, 1915				CK	CK			B	
Choleva sturmi C.N.F. Brisout de Barneville, 1863	H		X	CK	CK	N		CK	
Nargus badius badius (Sturm, 1839)	H	X	X	CK	CK	X	X	B	

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Nargus brunneus (Sturm, 1839)					CK			CK	
Nargus velox velox (Spence, 1813)	X	X	X		CK	X	X	CK	
Nargus wilkini (Spence, 1813)			CK	CK	CK	X	CK	B	
Leptodirini Lacordaire, 1854 **Bathysciina** Horn, 1880									
Phaneropella lesinae (Reitter, 1881)	B								
Pholeuina Reitter, 1886									
Bathysciola ruffoi Tamanini, 1955 [E]		B	CK		N	X			
Ptomaphagini Jeannel, 1911 **Ptomaphagina** Jeannel, 1911									
Ptomophagus divaricatus Jeannel, 1934				B				B	
Ptomophagus pius pius (Seidlitz, 1887) [E]				CK	CK	CK			
Coloninae Horn, 1880									
Colon affine Sturm, 1839	H								
Colon bidentatum (C.R. Sahlberg, 1822)						N			
Colon fuscicorne Kraatz, 1852	H								
Colon griseum Czwalina, 1881					N	X		N	
Leiodinae Fleming, 1821 **Agathidiini** Westwood, 1838									
Agathidium badium Erichson, 1845	H	X	X	N	N	X	X	B	LC
Agathidium brisouti Reitter, 1884	X	N		N		N	X	B	DD
Agathidium dentatum dentatum Mulsant & Rey, 1861		N			N	N		B	LC
Agathidium laevigatulum Reitter, 1904		N		N	N				LC
Agathidium laevigatum laevigatum Erichson, 1845	H			N	N	N			LC
Agathidium mandibulare Sturm, 1807	X					X	X	N	LC
Agathidium marginatum Sturm, 1807					N	X			LC
Agathidium montemurroi Angelini & De Marzo, 1985		X				X	X	B	VU
Agathidium nigrinum Sturm, 1807	H	N		N	N	X	X	B	LC
Agathidium nigripenne (Fabricius, 1792)	H				N	X		B	LC
Agathidium nudum C. Hampe, 1870	X	B				X	X	B	DD
Agathidium obenbergeri Hlisnikovský, 1964 [E]		X		N	N	X	X	B	LC
Agathidium paganettianum Hlisnikovský, 1964 [E]	B					N	X	B	LC
Agathidium pisanum C.N.F. Brisout de Barneville, 1872		N	X		N	X	X	B	LC
Agathidium plagiatum (Gyllenhal, 1810)	X	X				X	X	B	LC
Agathidium rotundatum paganettii Reitter, 1908 [E]		N			N	X	X	B	LC
Agathidium seminulum (Linnaeus, 1758)	X				N	X		B	LC
Agathidium varians varians Beck, 1817	X	X		N				B	LC
Amphicyllis globiformis (C.R. Sahlberg, 1833)	H	N					X		LC
Amphicyllis globus (Fabricius, 1792)		N		N	N	X	X	N	LC
Anisotoma castanea castanea (Herbst, 1791)	X				N	X	X	N	LC
Anisotoma glabra (Fabricius, 1787)	X					X	X	N	VU
Anisotoma humeralis (Herbst, 1791)	X	X			N	X	X	N	LC
Anisotoma orbicularis (Herbst, 1791)	H			N		X	X		LC
Leiodini Fleming, 1821									
Leiodes badia (Sturm, 1807)		X		N		X	X	N	
Leiodes brunnea (Sturm, 1807)	H				CK				
Leiodes calcarata (Erichson, 1845)	H		X			X			
Leiodes cinnamomea (Panzer, 1793)					N				
Leiodes flavicornis (C.N.F. Brisout de Barneville, 1884)		X						B	
Leiodes litura Stephens, 1835								B	
Leiodes longipes (W.L.E. Schmidt, 1841)						X			
Leiodes macropus (Rye, 1873)					N				

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Leiodes oblonga (Erichson, 1845)	H								
Leiodes obscura (Fairmaire & Coquerel, 1859)	B								
Pseudoliodini Portevin, 1926									
Agaricophagus cephalotes (W.L.E. Schmidt, 1841)			N		N	X			
Agaricophagus italicus Hlisnikovský, 1964					N				
Colenis immunda (Sturm, 1807)	H	X	X	N	N		X	N	
Sogdini Lopatin, 1961									
Hydnobius punctatus (Sturm, 1807)	H					N			
Platypsyllinae Ritsema, 1869									
Leptinus testaceus P.W.J. Müller, 1817	H	X			N	X	X	CK	
SILPHIDAE Latreille, 1806 **Silphinae** Latreille, 1806 Růžička in Cat. Pal. Col., vol. 2, 2015									
Ablattaria laevigata (Fabricius, 1775)	H	X	X	N	N	X	X	N	
Aclypea undata (O.F. Müller, 1776)	H					X	X		
Dendroxena quadrimaculata (Scopoli, 1771)			X	N	N	X	X	N	
Necrodes littoralis (Linnaeus, 1758)	X	X	X			N		N	
Phosphuga atrata atrata (Linnaeus, 1758)								B	
Silpha olivieri Bedel, 1887	H	X	X		N	X	X	N	
Silpha tristis Illiger, 1798		X		N	N	X	X	N	
Thanatophilus rugosus (Linnaeus, 1758)		X				X	X		
Thanatophilus sinuatus (Fabricius, 1775)		X					X	N	
Nicrophorinae Kirby, 1837									
Nicrophorus humator (Gleditsch, 1767)					N	B	X		
Nicrophorus interruptus Stephens, 1830	X	X		N		X	X	N	
Nicrophorus investigator Zetterstedt, 1824	X								
Nicrophorus vespilloides Herbst, 1783		N		N	B	N			
STAPHYLINIDAE Latreille, 1802 **Omaliinae** W.S. Macleay, 1825 **Anthophagini** C.G. Thomson, 1859 Smetana in Cat. Pal. Col., vol. 2, 2015									
Acidota cruentata Mannerheim, 1830					CK			B	
Amphichroum canaliculatum (Erichson, 1840)			X		B	X	X		
Anthobium atrocephalum (Gyllenhal, 1827)	H		CK	CK	CK	X	X	B	
Anthobium melanocephalum (Illiger, 1794)					B	X	X	B	
Anthophagus alpestris kochi Bernhauer, 1935 [E]						B			
Anthophagus bicornis (Block, 1799)					CK	X			
Anthophagus fauveli caprai Koch, 1933 [E]	CK	CK		CK	CK	X	X	B	
Anthophagus torretassoi pollinensis Koch, 1934 [E]				CK	CK	X			
Deliphrosoma platyophthalmum (Koch, 1937) [E]						X			
Geodromicus pedemontanus Fagel, 1958							X		
Lesteva corsica Perris, 1869								CK	
Lesteva lepontia Baudi di Selve, 1870				CK			CK		
Lesteva longoelytrata longoelytrata (Goeze, 1777)					CK	CK	CK	B	
Lesteva luctuosa Fauvel, 1871						X			
Lesteva monticola Kiesenwetter, 1847				N	CK	X	CK	CK	
Lesteva omissa omissa Mulsant & Rey, 1880					CK		CK		
Lesteva sicula sicula Erichson, 1840	X		CK	CK	B	CK	CK	B	
Orochares angustatus (Erichson, 1840)					CK				
Orochares calaber calaber (Zanetti, 1983) [E]								B	
Philorinum sordidum (Stephens, 1834)	X								

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Phyllodrepoidea crenata (Ganglbauer, 1895)	X				CK				NT
Coryphiini Jakobson, 1908									
Boreaphilus velox (Heer, 1839)	H		N	CK	B	CK		B	
Coryphium angusticolle Stephens, 1834					CK	CK		B	
Eusphalerini Hatch, 1957									
Eusphalerum atrum (Heer, 1839)	H			CK	CK				
Eusphalerum bargaglii (Luze, 1910)	X			B	CK	X		CK	
Eusphalerum baudii (A. Fiori, 1894) [E]	X	X		CK	CK	X	X	B	
Eusphalerum bivittatum (Eppelsheim, 1887) [E]		CK			CK	X	X	B	
Eusphalerum calabrum Zanetti, 1980 [E]					B	B	B	CK	
Eusphalerum cribrellum (Fauvel, 1900) [E]					CK	X	X	CK	
Eusphalerum italicum italicum (Koch, 1938) [E]	B			N					
Eusphalerum martinae Zanetti, 2004 [E]				B					
Eusphalerum primulae (Stephens, 1834)				CK					
Eusphalerum rectangulum (Baudi di Selve, 1870)		CK				X	CK		
Eusphalerum ruffoi (Scheerpeltz, 1956) [E]				B	B	X			
Eusphalerum schatzmayri (Koch, 1938) [E]					B	X	B		
Eusphalerum signatum angulatum (Luze, 1911) [E]					CK	X	X	CK	
Eusphalerum stussineri (Bernhauer, 1909) [E]		X		B	CK	X	X		
Eusphalerum viertli (Ganglbauer, 1895)					CK	CK			
Omaliini W.S. Macleay, 1825									
Acrolocha amabilis (Heer, 1841)					CK	X		B	
Acrolocha daccordii Zanetti, 1979 [E]			CK		B	CK	CK		
Acrolocha sulcula (Stephens, 1834)					B	CK			
Dropephylla ioptera (Stephens, 1834)					B	N			LC
Dropephylla vilis (Erichson, 1840)							CK	CK	NT
Hapalaraea pygmaea (Paykull, 1800)		X				CK			VU
Omalium caesum Gravenhorst, 1806	H		CK	CK	CK	N	CK	B	
Omalium cinnamomeum Kraatz, 1857	H	X		CK	CK	N	CK	B	
Omalium excavatum Stephens, 1834				N	CK	X	CK	B	
Omalium italicum Bernhauer, 1902	H	CK		CK	CK	CK	CK	B	
Omalium rivulare (Paykull, 1789)	H			CK	CK	X	X	CK	
Omalium rugatum Mulsant & Rey, 1880	CK		CK	CK	CK	CK	CK	CK	
Paraphloeostiba gayndahensis (W.S. Macleay, 1873)	N	CK	X	B	CK	CK	CK	CK	
Phloeonomus minimus (Erichson, 1839)					CK	CK			VU
Phloeonomus punctipennis J. Thomson, 1867	CK				CK	CK	CK		LC
Phloeonomus pusillus (Gravenhorst, 1806)	X	CK			CK	X	X		LC
Phloeostiba plana (Paykull, 1792)			N		CK	CK			LC
Phyllodrepa angelinii Zanetti, 2009 [E]					B				
Phyllodrepa floralis (Paykull, 1789)				CK	CK	X	X		
Phyllodrepa melanocephala pollinensis Scheerpeltz, 1956 [E]					CK	X	X		VU
Phyllodrepa nigra (Gravenhorst, 1806)	X	X			CK	B			VU
Phyllodrepa salicis (Gyllenhal, 1810)	X						X		VU
Xylodromus affinis (Gerhardt, 1877)	H	X	X	CK	CK	X			
Xylodromus depressus (Gravenhorst, 1802)			N		N	X			
Xylodromus testaceus (Erichson, 1840)	CK			CK	CK	CK	N	CK	
Xylostiba bosnica (Bernhauer, 1902)		X			CK				VU
Proteininae Erichson, 1839 **Anepiini** Steel, 1966									
Megarthrus bellevoyei Saulcy, 1862	X	X			N	N		N	
Megarthrus depressus (Paykull, 1789)	H								
Megarthrus prosseni Schatzmayr, 1904					N	N			

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Metopsia similis Zerche, 1998	H	N	N	N	N	X	X	B	
Proteinus angelinii Dauphin, 1999 [E]					B				
Proteinus atomarius Erichson, 1840		X	N			X	X	N	
Proteinus brachypterus (Fabricius, 1792)	H	X	N		N	X	X	N	
Proteinus crenulatus Pandellé, 1867							X		
Proteinus ovalis Stephens, 1834					N				
Micropeplinae Leach, 1815									
Micropeplus calabricus Reitter, 1907 [E]								N	
Micropeplus fulvus fulvus Erichson, 1840	H	X	X		N	N		N	
Micropeplus latus C. Hampe, 1861						X	N		
Micropeplus marietti Jacquelin du Val, 1857			X		N		X		
Micropeplus porcatus (Paykull, 1789)	H								
Micropeplus staphylinoides (Marsham, 1802)	H	N	N		N	N		N	
Dasycerinae Reitter, 1887									
Dasycerus sulcatus Brongniart, 1800				N	N	X	X	B	LC
Pselaphinae Latreille, 1802									
Batrisitae Reitter, 1882									
Batrisini Reitter, 1882									
Batrisina Reitter, 1882									
Löbl & Besuchet in Cat. Pal. Col., vol. 2, 2015									
Batrisodes adnexus (C. Hampe, 1863)	X	X				X	X	B	LC
Batrisodes delaporti (Aubé, 1833)	X								NT
Batrisodes oculatus (Aubé, 1833)	X	X				N		B	LC
Batrisodes venustus (Reichenbach, 1816)	X	X				X	X	B	LC
Batrisus formicarius Aubé, 1833	X							B	VU
Clavigerini Leach, 1815									
Apoderigerina Jeannel, 1954									
Claviger apenninus Baudi di Selve, 1870 [E]	X	X			CK	N	X	CK	
Euplectini Streubel, 1839									
Euplectus bonvouloiri narentinus Reitter, 1882	CK	X			CK	CK		B	LC
Euplectus bonvouloiri rosae Raffray, 1910		B					!		LC
Euplectus brunneus Grimmer, 1841	X	X		N		X	X	B	NT
Euplectus corsicus Guillebeau, 1888	H							B	LC
Euplectus karstenii (Reichenbach, 1816)	X	X		CK		X			LC
Euplectus kirbyi hummleri Reitter, 1906	H	X		N	CK	X	X	B	LC
Euplectus piceus lucanus Meggiolaro, 1966 [E]					B				CR
Euplectus theryi Guillebeau, 1894		CK			CK	CK		B	NT
Euplectus tholini Guillebeau, 1888	X	X						B	VU
Euplectus verticalis Reitter, 1884								B	NT
Mayetiini Winkler, 1925									
Mayetia garganica Pace, 1975 [E]	X								
Trichonychini Reitter, 1882									
Bibloporina O. Park, 1951									
Amauronyx maerkelii (Aubé, 1844)		X						B	NT
Aphilia crassipes (Raffray, 1908)					B			B	
Bibloplectus ambiguus (Reichenbach, 1816)								B	
Bibloplectus delhermi Guillebeau, 1888		CK	CK						
Bibloplectus limatus Normand, 1939		CK						B	
Bibloplectus obtusus Guillebeau, 1888			X						
Bibloplectus pusillus (Denny, 1825)		CK							
Bibloplectus tenebrosus (Reitter, 1880)								B	
Bibloporus bicolor devillei Jeannel, 1950					CK	X		B	NT

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Bibloporus mayeti Guillebeau, 1888	!				CK				NT
Bibloporus minutus Raffray, 1914	CK							B	NT
Bibloporus ultimus Guillebeau, 1892	!				CK	X		B	NT
Pseudoplectus perplexus (Jacquelin du Val, 1854)		CK						B	
Trichonyx sulcicollis (Reichenbach, 1816)	H	N					X		NT
Trimium besucheti Sabella, 1989 [E]								B	VU
Trimium brevicorne (Reichenbach, 1816)				CK	CK	!			LC
Trimium minimum Dodero, 1900		X						B	NT
Trimium paganettii Reitter, 1906 [E]					CK	!		B	VU
Trimium zoufali Krauss, 1900 [E]					CK			B	LC
Trichonychini taxa incertae sedis									
Meliceria sulciventris (Guillebeau, 1888)	CK	B			CK			B	VU
Plectophloeus fischeri (Aubé, 1833)						CK	CK	B	LC
Plectophloeus nitidus (Fairmaire, 1858)								B	LC
Plectophloeus nubigena bosnicus Besuchet, 1964					CK	N	CK	B	VU
Faronini Reitter, 1882									
Faronus aubei P.H. Lucas, 1854								B	
Faronus lafertei Aubé, 1844	H			CK				B	
Faronus stolzi W. Blattný & C. Blattný, 1914 [E]								B	
Brachyglutini Raffray, 1904									
Brachyglutina Raffray, 1904									
Brachygluta abrupta Dodero, 1919	X	X							
Brachygluta angelinii Sabella, 1997 [E]			B						
Brachygluta appennina (Saulcy, 1876)		CK	X		CK	X	X	B	
Brachygluta aubei (Tournier, 1868)								B	
Brachygluta fossulata (Reichenbach, 1816)		!		CK	CK	CK			
Brachygluta foveola foveola (Motschulsky, 1840)	X	X	X	N		X	X	B	
Brachygluta furcata (Motschulsky, 1835)			X						
Brachygluta galathea (Saulcy, 1876) [E]		X						B	
Brachygluta guillemardi (Saulcy, 1876)			X						
Brachygluta helferi helferi (Schmidt-Göbel, 1836)	X	X	!	N		X	X	B	
Brachygluta hipponensis (Saulcy, 1876)		CK						B	
Brachygluta lefebvrei lefebvrei (Aubé, 1833)	CK		X						
Brachygluta numidica (Saulcy, 1876)							CK		
Brachygluta pandellei (Saulcy, 1876)								B	
Brachygluta perforata (Aubé, 1833)	X	X	X		CK	N			
Brachygluta ragusae (Saulcy, 1876)	H	X		N	CK	X		B	
Brachygluta tibialis (Aubé, 1844)	B								
Brachygluta trigonoprocta (Ganglbauer, 1895)		X	X			CK			
Fagniezia impressa (Panzer, 1803)		X							
Reichenbachia chevrieri (Aubé, 1844)	X					!		B	
Reichenbachia nigriventris (Schaum, 1859)	X	X						B	
Rybaxis longicornis (Leach, 1817)	X	X	X	CK	CK	N		B	
Trissemus antennatus antennatus (Aubé, 1833)		X	CK	CK	CK			B	
Trissemus olivieri (Raffray, 1871)	N	N	X	N	N			B	
Bythinini Raffray, 1890									
Bryaxis chevrolati (Aubé, 1833)		CK			CK				
Bryaxis curtisi orientalis (Karaman, 1952)					B	X	X	B	VU
Bryaxis italicus (Baudi di Selve, 1870)	H	X	X	N	N	X	X	B	
Bryaxis paganettii (W. Blattný & C. Blattný, 1914) [E]				N	B	X	X	B	
Bryaxis pedator (Reitter, 1882) [E]		X	X	B	B	X	X	B	
Bryaxis picteti meridionalis (Machulka, 1932) [E]		X		N	CK	X	X	B	
Bryaxis porzenna (Reitter, 1882)					B	!			

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Bryaxis samniticus W. Blattný & C. Blattný, 1914 [E]	X	X		N	B	X	X		
Tychobythinus andreinii (Dodero, 1919) [E]					B				
Tychobythinus glabratus (Rye, 1870)	H	B			B	CK		B	
Tychobythinus gularis (Dodero, 1919) [E]			X		B				
Tychini Raffray, 1904									
Tychus angelinii Sabella & Poggi, 1997 [E]			B		CK			B	
Tychus corsicus spissatus Rey, 1888			X		CK				
Tychus dalmatinus Reitter, 1880		X							
Tychus florentinus Reitter, 1884 [E]					CK				
Tychus jacquelinii Boieldieu, 1859	H							B	
Tychus lucanus Sabella & Poggi, 1997 [E]					CK				
Tychus normandi Jeannel, 1950				CK	CK	CK		B	
Tychus pullus Kiesenwetter, 1858	X	X	X						
Ctenistini C.É. Blanchard, 1845									
Ctenistes palpalis Reichenbach, 1816			X						
Pselaphini Latreille, 1802									
Pselaphogenius aspromontanus (Reitter, 1910) [E]								B	
Pselaphogenius calabrus (Reitter, 1910) [E]								B	
Pselaphogenius lucanicus Besuchet, 1964 [E]					B				
Pselaphogenius neapolitanus (Besuchet, 1964) [E]				B	CK	CK			
Pselaphus parvus Karaman, 1940	H	X	X	N	CK	N			
Tyrini Reitter, 1882 **Tyrina** Reitter, 1882									
Tyrus mucronatus mucronatus (Panzer, 1805)	X	X				CK	X	B	NT
Phloeocharinae Erichson, 1839									
Phloeocharis subtilissima Mannerheim, 1830		N	N		N	N	N	N	LC
Tachyporinae W.S. Macleay, 1825 **Mycetoporini** C.G. Thomson, 1859									
Bolitobius cingulatus Mannerheim, 1830	H					N			
Bryophacis rufus (Erichson, 1839)					N	X			
Bryoporus cernuus (Gravenhorst, 1806)					N				
Bryoporus multipunctus C. Hampe, 1867					N				
Carphacis striatus (A.G. Olivier, 1795)	X				N	N	N	N	
Ischnosoma longicorne (Mäklin, 1847)			N		N	N		B	
Ischnosoma splendidum (Gravenhorst, 1806)	H	X	X	N	N	N		N	
Lordithon exoletus (Erichson, 1839)	H	X			N	X	X	B	
Lordithon lunulatus (Linnaeus, 1760)	H			N	N	X	X	N	
Lordithon thoracicus thoracicus (Fabricius, 1777)	H	X	X	N	N	X	X	B	
Lordithon trimaculatus (Fabricius, 1792)	N	X				N			
Mycetoporus altaicus Luze, 1901						X			
Mycetoporus angularis Mulsant & Rey, 1853	H								
Mycetoporus baudueri Mulsant & Rey, 1875	H	N							
Mycetoporus brucki (Pandellé, 1869)						X			
Mycetoporus confinis Rey, 1883					N			N	
Mycetoporus eppelsheimianus Fagel, 1968					N	N	N		
Mycetoporus forticornis Fauvel, 1875	H								
Mycetoporus glaber glaber (Sperk, 1835)								B	
Mycetoporus longulus Mannerheim, 1830						X			
Mycetoporus macrocephalus Bernhauer, 1917	H				N	X		B	
Mycetoporus mulsanti Ganglbauer, 1895	H				N	X			
Mycetoporus nigricollis Stephens, 1835	H	X	X			N		N	
Mycetoporus piceolus Rey, 1883	H				N				

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Mycetoporus punctus (Gravenhorst, 1806)				N	N	X		N	
Mycetoporus reichei (Pandellé, 1869)	H				N			N	
Mycetoporus rufescens (Stephens, 1832)	H			N	N	X	X	B	
Mycetoporus silvaticus Jablokoff-Khnzorian, 1962					B			B	
Mycetoporus solidicornis Wollaston, 1864		X		N					
Parabolitobius inclinans (Gravenhorst, 1806)					N	X	X		
Tachyporini W.S. Macleay, 1825									
Cilea silphoides (Linnaeus, 1767)		X	X	N		X	X		
Sepedophilus bipunctatus (Gravenhorst, 1802)	N	N							NT
Sepedophilus bipustulatus (Gravenhorst, 1802)	X	X				X	X		NT
Sepedophilus immaculatus (Stephens, 1832)		X	X	N					LC
Sepedophilus littoreus (Linnaeus, 1758)					N				
Sepedophilus lusitanicus Hammond, 1973		X	X			X	X		NT
Sepedophilus marshami (Stephens, 1832)			X		N				LC
Sepedophilus nigripennis (Stephens, 1832)	H	X	X		N			B	
Sepedophilus testaceus (Fabricius, 1792)		X			N	N	N	N	LC
Tachinus flavolimbatus Pandellé, 1869	H	X						N	
Tachinus humeralis humeralis Gravenhorst, 1802	X		N	N	N	X	X	N	
Tachinus marginellus angelinii Schülke, 1996 [E]	X	X		N	B	X	X	B	
Tachinus rufipes (Linnaeus, 1758)					N	N			
Tachinus subterraneus (Linnaeus, 1758)	X		X	N	N	X	X		
Tachyporus abner Saulcy, 1865					N		X	N	
Tachyporus atriceps Stephens, 1832	X								
Tachyporus caucasicus Kolenati, 1846					N			N	
Tachyporus chrysomelinus (Linnaeus, 1758)	X	X	N	N		X	X		
Tachyporus dispar (Paykull, 1789)					N				
Tachyporus formosus A. Matthew, 1838		X						B	
Tachyporus hypnorum (Fabricius, 1775)	X	X	X	B	N	X	X	B	
Tachyporus nitidulus (Fabricius, 1781)	H	X	X	N	N	X	X	B	
Tachyporus pusillus Gravenhorst, 1806	H		X	N		X	X	B	
Tachyporus scitulus Erichson, 1839					N				
Tachyporus solutus Erichson, 1839	H	X	X	N	N	X		B	
Trichophyinae J. Thomson, 1858									
Trichophya pilicornis (Gyllenhal, 1810)	H				N	X	X	N	
Habrocerinae Mulsant & Rey, 1876									
Habrocerus capillaricornis (Gravenhorst, 1806)	H	X	X	N	N	X	X	B	
Habrocerus pisidicus Korge, 1971	B				N				
Aleocharinae Fleming, 1821 **Aleocharini** Fleming, 1821 **Aleocharina** Fleming, 1821									
Aleochara bilineata Gyllenhal, 1810		X						B	
Aleochara binotata Kraatz, 1856					N				
Aleochara bipustulata (Linnaeus, 1760)	H	X	N	N	N	X	X	B	
Aleochara brevipennis Gravenhorst, 1806			N						
Aleochara crassa Baudi di Selve, 1848								B	
Aleochara curtula (Goeze, 1777)	X	X		N		X	X		
Aleochara diversa (J. Sahlberg, 1876)								B?	
Aleochara funebris Wollaston, 1864						X	X	N	
Aleochara grisea Kraatz, 1856		X							
Aleochara haemoptera Kraatz, 1858			X	N	N	X	X	N	
Aleochara hummleri Bernhauer, 1914 [E]							N		
Aleochara intricata Mannerheim, 1830	H		X	N	N	X	X	B	

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Aleochara lanuginosa Gravenhorst, 1802	H				N	N		B	
Aleochara lata Gravenhorst, 1802					N				
Aleochara laticornis Kraatz, 1856	H							N	
Aleochara maculata C.N.F. Brisout de Barneville, 1863	H								
Aleochara milleri Kraatz, 1862					N				
Aleochara moesta Gravenhorst, 1802		X							
Aleochara puberula Klug, 1832								N	
Aleochara sparsa Heer, 1839	X			N	N	X	X	B	
Aleochara spissicornis Erichson, 1839	H								
Aleochara stichai Likovský, 1965					N	N			
Aleochara tristis Gravenhorst, 1806	H	X		N	N	X	X	B	
Aleochara verna Say, 1833								N	
Amarochara bonnairei (Fauvel, 1865)	H				B				
Tinotus morion (Gravenhorst, 1802)		X					N	N	
Athetini Casey, 1910 **Athetina** Casey, 1910									
Acrotona aterrima (Gravenhorst, 1802)								N	
Acrotona benicki (Allen, 1940)		N							
Acrotona muscorum (C.N.F. Brisout de Barneville, 1860)	X				N			B	
Acrotona nigerrima (Aubé, 1850)					N				
Acrotona parens (Mulsant & Rey, 1852)	H							B	
Acrotona parvula (Mannerheim, 1830)	H								
Acrotona piceorufa (Mulsant & Rey, 1873)						N		N	
Acrotona pygmaea (Gravenhorst, 1802)			N					B	
Alianta incana (Erichson, 1837)		N							
Amischa analis (Gravenhorst, 1802)	H		X		N				
Amischa forcipata Mulsant & Rey, 1873								N	
Atheta aeneicollis (Sharp, 1869) cf.			X		N	N		N	
Atheta amicula (Stephens, 1832)	H	X							
Atheta atramentaria (Gyllenhal, 1810)	H				N				
Atheta benickiella Brundin, 1948								N	
Atheta britanniae Bernhauer & Scheerpeltz, 1926				N	N	X	X	B	
Atheta burlei Tronquet, 1999								B	
Atheta castanoptera (Mannerheim, 1830)	H	N		N		X		B	
Atheta celata (Erichson, 1837)								B	
Atheta clientula (Erichson, 1839)	H	X						B	
Atheta coriaria (Kraatz, 1856)					N				
Atheta corvina (J. Thomson, 1856)	N								
Atheta crassicornis (Fabricius, 1792)	H			N	N			B	
Atheta dadopora J. Thomson, 1867						N		N	
Atheta elongatula (Gravenhorst, 1802)		X							
Atheta fungi (Gravenhorst, 1806)	H					N			
Atheta gagatina (Baudi di Selve, 1848)	H	X			N	N			
Atheta harwoodi B.S. Williams, 1930						N		B	
Atheta hybrida Sharp, 1869					N	N			
Atheta hygrotopora (Kraatz, 1856)						X	N	B	
Atheta hypnorum (Kiesenwetter, 1850)								N	
Atheta incognita (Sharp, 1869)		N			N	N			
Atheta intermedia (J. Thomson, 1852)							X		
Atheta laevana (Mulsant & Rey, 1852)	H								
Atheta laevicauda J. Sahlberg, 1876					N			N	
Atheta laticollis (Stephens, 1832)					N	N			
Atheta leonhardi Bernhauer, 1911				N		X			

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Atheta liliputana C.N.F. Brisout de Barneville, 1860						N			
Atheta longicornis (Gravenhorst, 1802)	H	X	N	N	N	N		B	
Atheta marcida (Erichson, 1837)					N		X		
Atheta melanaria (Mannerheim, 1830)	H								
Atheta melanocera (J. Thomson, 1856)	H	X							
Atheta nigra (Kraatz, 1856)						N			
Atheta nigritula (Gravenhorst, 1802)	H				N	N	N	N	
Atheta oblita (Erichson, 1839)		N	N		N			N	
Atheta orbata (Erichson, 1837)		N	X	N				B	
Atheta orphana (Erichson, 1837)		X						B	
Atheta palleola (Erichson, 1837)					N				
Atheta pallidicornis (J. Thomson, 1856)						X			LC
Atheta palustris (Kiesenwetter, 1844)	H				N			B	
Atheta parca (Mulsant & Rey, 1873)								N	
Atheta picipes (J. Thomson, 1856)	H				N		X	N	LC
Atheta pilicornis (J. Thomson, 1852)					N				
Atheta putrida (Kraatz, 1856)					N				
Atheta ravilla (Erichson, 1839)	H		N		N			N	
Atheta scapularis (C.R. Sahlberg, 1831)			X					N	
Atheta taxiceroides Munster, 1932					N				
Atheta testaceipes (Heer, 1839)	H	X	N						
Atheta triangulum (Kraatz, 1856)	H	X		N	N	N	X	N	
Atheta trinotata (Kraatz, 1856)	H				N	N	X	B	
Atheta vaga (Heer, 1839)					N				
Atheta volans (W. Scriba, 1859)			N						
Dinaraea linearis (Gravenhorst, 1802)	X								NT
Hydrosmecta delicatissima (Bernhauer, 1908)								B	
Liogluta alpestris (Heer, 1839)						X	N	N	
Liogluta longiuscula (Gravenhorst, 1802)	H		X	B	N	X	N	B	
Liogluta wuesthoffi (G. Benick, 1938)					N	N			
Nehemitropia lividipennis (Mannerheim, 1830)		X	X	N		X		B	
Ousipalia caesula (Erichson, 1839)		X							
Thamiaraeina Fenyes, 1921									
Thamiaraea cinnamomea (Gravenhorst, 1802)		X	N		N			B	LC
Thamiaraea hospita (Märkel, 1844)		X			N	N			LC
Autaliini C.G. Thomson, 1859									
Autalia impressa (A.G. Olivier, 1795)	H	X		N	N	N		B	
Autalia longicornis Scheerpeltz, 1947	N	X	N		N	N	N	B	
Autalia puncticollis Sharp, 1864						N			
Autalia rivularis (Gravenhorst, 1802)	H					N	N		
Falagriini Mulsant & Rey, 1873									
Cordalia obscura (Gravenhorst, 1802)	H	X	N	N	N	N	N	N	
Falagria splendens Kraatz, 1858		X	X			N			
Falagria sulcatula (Gravenhorst, 1806)		X	X						
Falagrioma thoracica (Stephens, 1832)			N	N	N	N		B	
Geostibini Seevers, 1978									
Alevonota crypticola (Pace, 1977)					B				
Alevonota egregia (Rye, 1876)						B			
Alevonota gracilenta (Erichson, 1839)	H	B							
Alevonota rufotestacea (Kraatz, 1856)	B				N			B	
Aloconota gregaria (Erichson, 1839)		X	N		N	N	N	N	
Aloconota insecta (J. Thomson, 1856)	H							N	
Aloconota planifrons (G.R. Waterhouse, 1863)					N				

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Aloconota sulcifrons (Stephens, 1832)				N	N	X		B	
Callicerus atricollis (Aubé, 1850)	H	X	N						
Callicerus rigidicornis (Erichson, 1839)								N	
Earota reyi (Kiesenwetter, 1850)					N	X		B	
Geostiba aspromontana Pace, 1977								B	
Geostiba focarilei (Scheerpeltz, 1956) [E]						X			
Geostiba garganica Pace, 2002 [E]	B								
Geostiba leonhardi (Bernhauer, 1908) [E]	H								
Geostiba lucana Pace, 2002 [E]				B					
Geostiba tamaninii (Scheerpeltz, 1956) [E]						X			
Homalotini Heer, 1839 **Bolitocharina** C.G. Thomson, 1859									
Bolitochara bella Märkel, 1844	H	X		N	N	B		B	
Bolitochara obliqua Erichson, 1837	H					X	X		LC
Bolitochara tecta Assing, 2014				N	B	X		B	CR
Caloderina hierosolymitana (Saulcy, 1865)	H					X		N	
Euryusa optabilis Heer, 1839	X					X	X		LC
Leptusa fuliginosa (Aubé, 1850)						N			VU
Leptusa fumida (Erichson, 1839)					N	CK			LC
Leptusa kochiana aspromontana Pace, 1977 [E]								B	
Leptusa kochiana kochiana Bernhauer, 1936 [E]					CK	X			
Leptusa pulchella (Mannerheim, 1830)					N	X		B	LC
Leptusa ruficollis (Erichson, 1839)	H			N	N	B	B	N	LC
Leptusa salernitana Pace, 1979 [E]					B				
Leptusa secreta Bernhauer, 1900						CK		B	
Gyrophaenina Kraatz, 1856									
Agaricochara latissima (Stephens, 1832)	H								
Gyrophaena affinis Mannerheim, 1830	X	X							
Gyrophaena bihamata J. Thomson, 1867	H								
Gyrophaena congrua Erichson, 1837						X			
Gyrophaena joyioides Wüsthoff, 1937		N	N					N	
Gyrophaena lucidula Erichson, 1837			N						
Gyrophaena manca Erichson, 1839		X							
Gyrophaena muensteri A. Strand, 1935	X								
Gyrophaena nitidula (Gyllenhal, 1810)					N				
Gyrophaena poweri Crotch, 1867		X							
Homalotina Heer, 1839									
Anomognathus cuspidatus (Erichson, 1839)	H	X							LC
Homalota plana (Gyllenhal, 1810)		X							LC
Hypocyphtini Laporte, 1835									
Cypha longicornis (Paykull, 1800)	H	X	X	N	N	N		N	
Cypha ovulum (Heer, 1839)							N		
Cypha seminulum (Erichson, 1839)								N	
Cypha spathulata Assing, 2007	!		!					!	
Cypha tarsalis (Luze, 1902)						N			
Holobus apicatus (Erichson, 1837)								N	
Holobus flavicornis (Lacordaire, 1835)	H		N		N				
Oligota inflata (Mannerheim, 1830)		X							
Oligota muensteri latior Kapp, 2019		B			B			B	
Oligota pumilio Kiesenwetter, 1858					N				
Oligota punctulata Heer, 1839			N						
Oligota pusillima (Gravenhorst, 1806)			X			N			

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Lomechusini Fleming, 1821 **Myrmedoniina** J. Thomson, 1867									
Drusilla canaliculata (Fabricius, 1787)			X			N			
Drusilla italica (Bernhauer, 1903) [E]		X		N	N	X		B	
Myrmoecia rigida (Erichson, 1839)			X						
Pella cognata (Märkel, 1842)	H								
Pella funesta (Gravenhorst. 1806)					N				
Pella humeralis (Gravenhorst, 1802)					N			N	
Pella laticollis (Märkel, 1844)	H		X						
Pella ruficollis (Grimm, 1845)	X	X							
Pella similis (Märkel, 1844)	H								
Zyras collaris (Paykull, 1800)	H							N	
Zyras fulgidus (Gravenhorst, 1806)	H				N				
Myllaenini Ganglbauer, 1895									
Myllaena brevicornis (A.H. Matthews, 1838)						N			
Myllaena intermedia Erichson, 1837		N	X		N	N		N	
Oxypodini C.G. Thomson, 1859 **Dinardina** Mulsant & Rey, 1873									
Homoeusa acuminata (Märkel, 1842)	H	N							
Meoticina Seevers, 1978									
Meotica exilis (Gravenhorst, 1806)				N		X		N	
Microglottina Fenyes, 1918									
Crataraea suturalis (Mannerheim, 1830)	X					X	X		
Haploglossa gentilis (Märkel, 1844)					N				
Haploglossa marginalis (Gravenhorst, 1806)					N				
Haploglossa picipennis (Gyllenhal, 1827)								N	
Haploglossa villosula (Stephens, 1832)					N	N			
Oxypodina C.G. Thomson, 1859									
Calodera aethiops (Gravenhorst, 1802)			X					N	
Calodera ligula Assing, 1996			N					B	
Calodera nigrita Mannerheim, 1830								N	
Cousya defecta (Mulsant & Rey, 1875)	H								
Cousya longitarsis (J. Thomson, 1867)		X							
Cousya nigrata (Fairmaire & Laboulbène, 1856)	H								
Dexiogya corticina (Erichson, 1837)		X						N	LC
Euryalaea murina (Erichson, 1839)						N			
Ocalea badia Erichson, 1837	H								
Ocalea pollinensis Scheerpeltz, 1956						X			
Oxypoda abdominalis (Mannerheim, 1830)					N	N		N	
Oxypoda alternans (Gravenhorst, 1802)	X	X	N	N	N	X	X	B	
Oxypoda annularis (Mannerheim, 1830)				N	N	N		N	
Oxypoda brevicornis (Stephens, 1832)	N		X?	N	N	N		N	
Oxypoda carbonaria (Heer, 1841)			N						
Oxypoda doderoi Bernhauer, 1902								B	
Oxypoda ferruginea Erichson, 1839	H								
Oxypoda formosa Kraatz, 1856	X		N		N	X		B	
Oxypoda fusina Mulsant & Rey, 1875	X				B	B			
Oxypoda haemorrhoa (Mannerheim, 1830)								N	
Oxypoda induta Mulsant & Rey, 1861	H								
Oxypoda lurida Wollaston, 1857	H								
Oxypoda nova Bernhauer, 1902								B	
Oxypoda opaca (Gravenhorst, 1802)	H	X	X	N	N	N		B	

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Oxypoda togata Erichson, 1837			N						
Oxypoda vittata Märkel, 1842	H			N		N		B	
Tetralaucopora longitarsis (Erichson, 1839)		N			N			B	
Phloeoporina C.G. Thomson, 1859									
Phloeopora teres (Gravenhorst, 1802)	H	X				X	X		LC
Phloeopora testacea (Mannerheim, 1830)	H						X		LC
Phytosini J. Thomson, 1867									
Phytosus spinifer Curtis, 1838	X								
Placusini Mulsant & Rey, 1871									
Placusa adscita Erichson, 1839					N				NT
Placusa atrata (Mannerheim, 1830)	H								LC
Placusa complanata Erichson, 1839							X		LC
Placusa pumilio (Gravenhorst, 1802)						N		N	LC
Pronomaeini Mulsant & Rey, 1873									
Pronomaea picea Heer, 1841								B	
Tachyusini C.G. Thomson, 1859									
Dilacra luteipes (Erichson, 1837)		X							
Gnypeta carbonaria (Mannerheim, 1830)			X						
Gnypeta rubrior Tottenham, 1939		N						B	
Ischnopoda umbratica (Erichson, 1837)								B	
Tachyusa balteata Erichson, 1839						N			
Tachyusa coarctata Erichson, 1837		X			N			B	
Tachyusa objecta Mulsant & Rey, 1870						X			
Taxicerini Lohse, 1989									
Taxicera deplanata (Gravenhorst, 1802)					B				
Scaphidiinae Latreille, 1806 **Scaphiini** Achard, 1924 Löbl in Cat. Pal. Col., vol. 2, 2015									
Scaphium immaculatum (A.G. Olivier, 1790)	H	X			N	X	X	N	NT
Scaphidiini Latreille, 1806									
Scaphidium quadrimaculatum A.G. Olivier, 1790	H	X		N	N	X	X	N	NT
Scaphisomatini Casey, 1894									
Baeocera nobilis nobilis Reitter, 1884	N					N		N	VU
Scaphisoma agaricinum (Linnaeus, 1758)	H	X							LC
Scaphisoma boleti boleti (Panzer, 1793)	N	X		N	N	X	N	N	
Scaphisoma boreale Lundblad, 1952	X					X	X	N	NT
Scaphisoma flavonotatum Pic, 1905	N	N				N			
Scaphisoma italicum Tamanini, 1955	X	X		N	N	X	X	B	LC
Scaphisoma loebli Tamanini, 1969		X				N			NT
Scaphisoma obenbergeri Löbl, 1963						N			NT
Scaphisoma subalpinum subalpinum Reitter, 1880	X			N		B			LC
Piestinae Erichson, 1839									
Siagonium humerale Germar, 1836	H								NT
Thoracophorina Reitter, 1909									
Thoracophorus corticinus Motschulsky, 1837	B								
Oxytelinae Fleming, 1821 **Blediini** Adam, 2001									
Bledius atricapillus (Germar, 1825)		X							
Bledius cribricollis Heer, 1839		N							
Bledius fossor Heer, 1839						X		B	
Bledius frater Kraatz, 1857		X							

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Bledius furcatus (A.G. Olivier, 1811)		X			N			B	
Bledius gallicus (Gravenhorst, 1806)			N						
Bledius graellsi graellsi Fauvel, 1865		X							
Bledius heterocerus Eppelsheim, 1889		N							
Bledius lohsei Schülke, 2011		X							
Bledius minor doderoi Bondroit, 1912	X								
Bledius minor minor Mulsant &. Rey, 1878		X			N				
Bledius occidentalis Bondroit, 1907								N	
Bledius tricornis (Herbst, 1784)		X							
Bledius tristis Erichson, 1840	X								
Bledius unicornis (Germar, 1825)		X						N	
Bledius verres Erichson, 1840		X						B	
Deleasteriini Reitter, 1909									
Deleaster dichrous (Gravenhorst, 1802)			X		N	X		N	
Oxytelini Fleming, 1821									
Anotylus complanatus (Erichson, 1839)	X	X				N		B	
Anotylus intricatus (Erichson, 1840)	X		X		N			N	
Anotylus inustus (Gravenhorst, 1806)	H	X	X	N	N	X	N	B	
Anotylus nitidulus (Gravenhorst, 1802)	X	X	X		N	X	X	B	
Anotylus pumilus (Erichson, 1839)			X					B	
Anotylus rugosus (Fabricius, 1775)	X	X	X		N	X	X	N	
Anotylus sculpturatus (Gravenhorst, 1806)	H	X	X	N	N	X	X	B	
Anotylus speculifrons (Kraatz, 1857)	H	N			N			N	
Anotylus tetracarinatus (Block, 1799)	H		X		N	N		B	
Oxytelus laqueatus (Marsham, 1802)		X			N				
Oxytelus migrator Fauvel, 1904					N				
Oxytelus piceus (Linnaeus, 1767)	H	X	X	N		X	N	N	
Oxytelus sculptus Gravenhorst, 1806		X	X						
Platystethus alutaceus J. Thomson, 1861			N			N			
Platystethus arenarius (Geoffroy, 1785)					N			B	
Platystethus burlei C.N.F. Brisout de Barneville, 1862			N						
Platystethus cornutus cornutus (Gravenhorst, 1802)		X	X					B	
Platystethus degener Mulsant & Rey, 1878			N	N		N		N	
Platystethus nitens (C.R. Sahlberg, 1832)	H	X	N	N	N	X	X	N	
Platystethus spinosus Erichson, 1840	H	X	X						
Planeustomini Jacquelin du Val, 1857									
Planeustomus cephalotes (Erichson, 1840)		X							
Planeustomus elegantulus (Kraatz, 1857)			X						
Thinobiini J. Sahlberg, 1876									
Carpelimus bilineatus Stephens, 1834		X	X						
Carpelimus corticinus (Gravenhorst, 1806)	H	X	X	N	N			B	
Carpelimus despectus (Baudi di Selve, 1870)		X			N				
Carpelimus exiguus (Erichson, 1839)		X	N					N	
Carpelimus foveolatus (C.R. Sahlberg, 1832)		X							
Carpelimus gracilis (Mannerheim, 1830)			X		N				
Carpelimus nigrita anthracinus (Mulsant & Rey, 1861)		X	N						
Carpelimus nitidus (Baudi di Selve, 1848)			X						
Carpelimus obesus (Kiesenwetter, 1844)			X	N				N	
Carpelimus politus politus (Kiesenwetter, 1850)		X						B	
Carpelimus pusillus (Gravenhorst, 1802)			X						
Carpelimus rivularis (Motschulsky, 1860)	H	X		N	N			B	
Thinodromus arcuatus (Stephens, 1834)						N		N	
Thinodromus hirticollis Mulsant & Rey, 1878		X							

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Oxyporinae Fleming, 1821									
Oxyporus rufus rufus (Linnaeus, 1758)	X	X			N	X	X	B	
Steninae W.S. Macleay, 1825									
Stenus aceris Stephens, 1833	H	X		N	N	X	X	B	
Stenus asphaltinus Erichson, 1840						X	X	B	
Stenus assequens assequens Rey, 1884			N	N	N	X		B	
Stenus ater Mannerheim, 1830	H	X			N			B	
Stenus atratulus Erichson, 1839	X					N	X	B	
Stenus bimaculatoides Scheerpeltz, 1969 [E]								N	
Stenus bimaculatus Gyllenhal, 1810								B	
Stenus binaghii Puthz, 1970 [E]						X			
Stenus brunnipes brunnipes Stephens, 1833	H		N	N	N			N	
Stenus butrintensis Smetana, 1959		N							
Stenus caligicola Puthz, 1970 [E]				N	N	X	X	N	
Stenus chobauti L. Benick, 1927	X	X			N	N		N	
Stenus cicindeloides (Schaller, 1783)			N						
Stenus comma peroculatus Puthz, 1986 [E]		B	N		N		X	B	
Stenus cordatus Gravenhorst, 1802	H	X		N	N	X	X	N	
Stenus cribratus Kiesenwetter, 1850	H								
Stenus elegans Rosenhauer, 1856	H	X		N	N	X	X	N	
Stenus flavipes flavipes Stephens, 1833							X		
Stenus fossulatus Erichson, 1840								N	
Stenus fuscicornis Erichson, 1840	H							N	
Stenus guttula guttula P.W.J. Müller, 1821		X	N	N	N			B	
Stenus hospes Erichson, 1840	H	X				X			
Stenus impressus Germar, 1824	N								
Stenus incanus Erichson, 1839					N				
Stenus intricatus zoufali A. Fleischer, 1909	B						X	N	
Stenus juno (Paykull, 1789)	H	X	X	N	N	X	X	N	
Stenus longipes Heer, 1839		X							
Stenus longitarsis edentatus Puthz, 1986		N			B				
Stenus longitarsis longitarsis J. Thomson, 1851	H								
Stenus melanopus (Marsham, 1802)		X	N						
Stenus mendicus Erichson, 1840								N	
Stenus nanus Stephens, 1833	H	X							
Stenus ochropus Kiesenwetter, 1858	H			N	N	X	X	B	
Stenus ossium Stephens, 1833				N		X	X	N	
Stenus pallitarsis pallitarsis Stephens, 1833		X							
Stenus picipennis Erichson, 1840			N		N	N		B	
Stenus picipes picipes Stephens, 1833			X	N		X		B	
Stenus planifrons planifrons Rey, 1884		X			N				
Stenus scaber Fauvel, 1871	H	N	X	N	N	N	X	N	
Stenus similis (Herbst, 1784)				N	N				
Stenus solutus Erichson, 1840		X							
Stenus subaeneus Erichson, 1840	H			N	N	X	X	B	
Stenus trivialis Kraatz, 1857	H	X	N	N	N	N		N	
Stenus umbricus Baudi di Selve, 1870			X		N	X	X		
Stenus vitalei Bernhauer, 1935								N	
Euaesthetinae C.G. Thomson, 1859 **Euaesthetini** C.G. Thomson, 1859									
Octavius vitalei vitalei Bernhauer, 1908								B	

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Scydmaeninae Leach, 1815 **Cephenniitae** Reitter, 1882 **Cephenniini** Reitter, 1882 Vít & Besuchet in Cat. Pal. Col., vol. 2, 2015									
Cephennium apicale apicale Reitter, 1882 [E]	X				N	N	X	N	
Cephennium romanum W. Blattný & C. Blattný, 1914 [E]	X							B	
Cephennium garganicum Pace, 1977 [E]	X								
Eutheiini Casey, 1897 Vít in Cat. Pal. Col., vol. 2, 2015									
Eutheia formicetorum Reitter, 1882	X	X			N	N		N	
Eutheia schaumi Kiesenwetter, 1858	H	N							
Euthiconus conicicollis (Fairmaire, 1855)	X					X		N	
Scydmaenitae Leach, 1815 **Chevrolatiini** Reitter, 1882 Vít in Cat. Pal. Col., vol. 2, 2015									
Chevrolatia insignis Jacquelin du Val, 1850	H	X	X					N	
Cyrtoscydmini L.W. Schaufuss, 1889 Davies in Cat. Pal. Col., vol. 2, 2015									
Euconnus campestris L.W. Schaufuss, 1866		B						N	
Euconnus claviger claviger (P.W.J. Müller & Kunze, 1822)		X							
Euconnus denticornis (P.W.J. Müller & Kunze, 1822)		B						N	
Euconnus fimetarius (Chaudoir, 1845)	X	X						N	
Euconnus hirticollis (Illiger, 1798)	X	X							
Euconnus intrusus intrusus (Schaum, 1844)		B							
Euconnus italicus Reitter, 1911 [E]						N			
Euconnus maklinii (Mannerheim, 1844)		X							
Euconnus oblongus oblongus (Sturm, 1838)				N	N	N		N	
Euconnus pubicollis (P.W.J. Müller & Kunze, 1822)				N	N	N			
Euconnus rutilipennis (P.W.J. Müller & Kunze, 1822)					N				
Euconnus wetterhalli (Gyllenhal, 1813)	X	X							
Microscydmus minimus (Chaudoir, 1845)					N				
Microscydmus nanus (Schaum, 1844)	B	X				X	B	B	
Neuraphes angulatus (P.W.J. Müller & Kunze, 1822)	H		X			X	X	N	
Neuraphes fiorii Reitter, 1887	X	N		N	N	N			
Neuraphes planiceps Reitter, 1884 [E]				N	N	X	X	N	
Neuraphes plicicollis plicicollis (Reitter, 1880)					N				
Neuraphes rubicundus (Schaum, 1841)	H?								
Neuraphes ruthenus Machulka, 1925					B				
Neuraphes stussineri Reitter, 1891 [E]							X		
Neuraphes talparum Lokay, 1920								N	
Scydmoraphes angelinii Castellini, 1987 [E]					B	N	N		
Scydmoraphes diutius Castellini, 1987 [E]			B	B	B	B	B	B	
Scydmoraphes geticus (Saulcy, 1877)		X			N				
Scydmoraphes helvolus (Schaum, 1844)					N	N	X	N	
Scydmoraphes leptocerus (Reitter, 1882)				B	B		N		
Scydmoraphes panormitanus (Ragusa, 1892) [E]								N	
Scydmoraphes romanus Franz, 1961 [E]								N	
Scydmoraphes sparshalli (Denny, 1825)	X	X			B	B	B	B	
Scydmoraphes tarsalis Machulka, 1930 [E]		N			N	N		B	
Stenichnus apulicus (Pic, 1902) [E]			N		N	N		B	
Stenichnus damryi hilfi Holdhaus, 1915	H				N	N	N		
Stenichnus egregius Holdhaus, 1915 [E]					N	X		B	

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Stenichnus helferi helferi (Schaum, 1841)	H	X		N	N	N		N	
Stenichnus paganettii Franz, 1960	N		N	N	N	N	X	B	
Stenichnus pelliceus Holdhaus, 1908								N	
Stenichnus pusillus (P.W.J. Müller & Kunze, 1822)	X	X	X		N				
Stenichnus scutellaris (P.W.J. Müller & Kunze, 1822)	X	X							
Scydmaenini Leach, 1815 Vit in Cat. Pal. Col., vol. 2, 2015									
Scydmaenus antidotus Schaum, 1841 [E]				N					
Scydmaenus cornutus Motschulsky, 1844		X			N	N		N	
Scydmaenus hellwigii (Herbst, 1791)	X	X		N	N	X			LC
Scydmaenus rufus P.W.J. Müller & Kunze, 1822	X	X				N			VU
Scydmaenus tarsatus P.W.J. Müller & Kunze, 1822	H	X	X	N	N	N		N	
Mastiginae Fleming, 1821 **Mastigitae** Fleming, 1821 **Leptomastacini** Casey, 1897 Vit in Cat. Pal. Col., vol. 2, 2015									
Leptomastax hypogea Pirazzoli, 1855	H			N		N		N	
Leptomastax emeryi Simon, 1881	H	N							
Mastigini Fleming, 1821									
Palaeostigus heydenii (Rottenberg, 1870) [E]	H	X		N	B	X	X	B	
Palaeostigus pilifer (Kraatz, 1879) [E]	X	X	X		B	X	X	B	
Palaeostigus ruficornis neapolitanus (Ganglbauer, 1899) [E]				B	B		X		
Leptotyphlinae Fauvel, 1874 **Entomoculiini** Coiffait, 1957									
Allotyphlus garganicus Pace, 1975 [E]	B								
Allotyphlus sipontinus Pace, 1985 [E]	B								
Allotyphlus transadriaticus Pace, 1977 [E]	B								
Neocyrtotyphlus apulus (Pace, 1975) [E]	X								
Pseudopsinae Ganglbauer, 1895									
Pseudopsis sulcata Newman, 1834				N	N	X	X		
Paederinae Fleming, 1821 **Paederini** Fleming, 1821 **Astenina** Hatch, 1957									
Astenus bimaculatus bimaculatus (Erichson, 1840)	H			N				N	
Astenus gracilis (Paykull, 1789)	H								
Astenus immaculatus Stephens, 1833	X	X	X			N			
Astenus knischi Bernhauer, 1928 [E]	X								
Astenus lyonessius (Joy, 1908)	X		X		N		X	B	
Astenus melanurus (Küster, 1853)	X							N	
Astenus thoracicus thoracicus (Baudi di Selve, 1857)		X	X		N			N	
Cryptobiina Casey, 1905									
Ochthephilum brevipenne (Mulsant & Rey, 1861)	B	X							
Ochthephilum collare (Reitter, 1884)		X	X	B					
Dolicaonina Casey, 1905									
Leptobium gracile (Gravenhorst, 1802)	H	X	X		N			N	
Leptobium pominii (Gridelli, 1949) [E]	X								
Scotonomus andreinii Binaghi, 1970 [E]					B				
Lathrobiina Laporte, 1835									
Achenium depressum (Gravenhorst, 1802)	X	X	X		N				
Achenium italicum Koch, 1937 [E]	X							N	
Achenium striatum (Latreille, 1804)								N	

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Achenium tenellum Erichson, 1840			X					N	
Domene stilicina (Erichson, 1840)	H							B	
Lathrobium crassipes Mulsant & Rey, 1878			X		N			N	
Lathrobium garganicum Koch, 1939 [E]	X								
Lathrobium longulum Gravenhorst, 1802								B	
Lobrathium multipunctum (Gravenhorst, 1802)	H	X	X	N	N	X	N	B	
Micrillus testaceus (Erichson, 1840)					N			N	
Platydomene picipes picipes (Erichson, 1840)								B	
Pseudobium gridellii Jarrige, 1949					N				
Pseudolathra lusitanica (Erichson, 1840)					N			N	
Scimbalium anale (Nordmann, 1837)		X						N	
Tetartopeus angustatus angustatus (Lacordaire, 1835)								B	
Tetartopeus paeneinsularum A. Bordoni, 1982			X	N					
Medonina Casey, 1905									
Hypomedon debilicornis (Wollaston, 1857)		X						N	
Lithocharis ochracea (Gravenhorst, 1802)		X			N				
Luzea nigritula (Erichson, 1840)	N	X	X		N			N	
Medon brunneus (Erichson, 1839)	H		X	N	N	N			
Medon perniger Coiffait, 1978	X		X		B	X		B	
Medon ripicola (Kraatz, 1854)	H								
Pseudomedon obsoletus (Nordmann, 1837)	X	N							
Sunius algiricus (Coiffait, 1970)								B	
Sunius italicus (Coiffait, 1961) [E]		X	X			B		N	
Sunius puglianus (Coiffait, 1961) [E]					N				
Paederina Fleming, 1821									
Paederidus rubrothoracicus (Goeze, 1777)		X		N	N	X	X	B	
Paederidus ruficollis (Fabricius, 1777)		X			N	N	N	B	
Paederus balcanicus Koch, 1938	X		X	N	N	N		N	
Paederus baudii Fairmaire, 1860				N		X	X	B	
Paederus fuscipes fuscipes Curtis, 1826	H	X	X		N	N	N	B	
Paederus littoralis littoralis Gravenhorst, 1802	X	X	X		N	N		B	
Paederus riparius (Linnaeus, 1758)	H								
Scopaeina Mulsant & Rey, 1878									
Micranops pilicornis (Baudi di Selve, 1870)					N				
Scopaeus bicolor Baudi di Selve, 1848								B	
Scopaeus debilis Hochhuth, 1851			X					N	
Scopaeus gracilis (Sperk, 1835)		N							
Scopaeus laevigatus (Gyllenhal, 1827)		X	X						
Scopaeus mitratus Binaghi, 1935	X	X	X		N			B	
Scopaeus portai Luze, 1910		X	X						
Scopaeus siculus Binaghi, 1935 [E]								B	
Scopaeus sulcicollis (Stephens, 1833)	H								
Stilicina Casey, 1905									
Rugilus angustatus (Geoffroy, 1785)	H				N				
Rugilus orbiculatus (Paykull, 1789)	H	X	X	N	N	N	N	B	
Rugilus rossii (Zanetti, 1977) [E]	H	X		N	N	N		B	
Rugilus similis (Erichson, 1839)	H		X			N			
Rugilus subtilis (Erichson, 1840)					N				
Procirrina Bernhauer & Schubert, 1912									
Oedichirus paederinus Erichson, 1840		N							
Procirrus lefebvrei lefebvrei Latreille, 1829								N	

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Staphylininae Latreille, 1802 **Othiini** C.G. Thomson, 1859									
Atrecus affinis (Paykull, 1789)				N	N	X	X	B	LC
Atrecus ardeanus Ciceroni, 1990 [E]					B	B	B		EN
Atrecus longiceps (Fauvel, 1873)						N			LC
Othius laeviusculus Stephens, 1833	H	X	X	N	N	X	X	N	
Othius lapidicola Märkel & Kiesenwetter, 1848	N			N	N	X	X	N	
Othius punctulatus (Goeze, 1777)	H			N	N	N			
Staphylinini Latreille, 1802 **Amblyopinina** Seevers, 1944									
Heterothops binotatus (Gravenhorst, 1802)	X								
Heterothops minutus Wollaston, 1860	H					X	X		
Heterothops praevius Erichson, 1839		X	X			N		N	
Philonthina Kirby, 1837									
Bisnius fimetarius (Gravenhorst, 1802)	X		X	N	N	X	X	B	
Bisnius sordidus (Gravenhorst, 1802)	X	X				X		B	
Cafius xantholoma (Gravenhorst, 1806)	X	X							
Erichsonius cinerascens (Gravenhorst, 1802)				B					
Erichsonius signaticornis (Mulsant & Rey, 1853)						N			
Erichsonius subopacus (Hochhuth, 1851)		X							
Gabrius breviventer (Sperk, 1835)		X							
Gabrius doderoi Gridelli, 1920	B	X		N		X	X	B	
Gabrius femoralis (Hochhuth, 1851)	H			N	N	N			
Gabrius nigritulus (Gravenhorst, 1802)	H	X	X	B	N	X	X	B	
Gabrius osseticus (Kolenati, 1846)	X						X		
Gabrius sexualis Smetana, 1954			X		N	X		N	
Gabrius splendidulus (Gravenhorst, 1802)						X			LC
Gabronthus maritimus (Motschulsky, 1858)	X	X			N	N		N	
Neobisnius lathrobioides (Baudi di Selve, 1848)			X	B				B	
Neobisnius procerulus procerulus (Gravenhorst, 1806)			X						
Orthidus cribratus (Erichson, 1840)	X	X							
Philonthus albipes (Gravenhorst, 1802)			X						
Philonthus atratus (Gravenhorst, 1802)			X			X		B	
Philonthus carbonarius (Gravenhorst, 1802)	H	N						B	
Philonthus cognatus Stephens, 1832	H	X		B	N	X	X	B	
Philonthus concinnus (Gravenhorst, 1802)	H	X	X	N	N	X	X	B	
Philonthus confinis A. Strand, 1941			X		N			N	
Philonthus coprophilus Jarrige, 1949			X			X	X		
Philonthus corruscus (Gravenhorst, 1802)	H	X	X			X			
Philonthus cruentatus (Gmelin, 1790)		X					X		
Philonthus debilis (Gravenhorst, 1802)	H	X		N	N	N	X	B	
Philonthus decorus (Gravenhorst, 1802)				N	N	X	X		
Philonthus dimidiatipennis Erichson, 1840					N				
Philonthus ebeninus (Gravenhorst, 1802)	X					X			
Philonthus fenestratus Fauvel, 1872	X	X				X	X		
Philonthus frigidus Märkel & Kiesenwetter, 1848						X			
Philonthus fumarius (Gravenhorst, 1806)			X			X			
Philonthus gagates Mulsant & Rey, 1876							X		
Philonthus intermedius (Lacordaire, 1835)	X	X	X	N	N	X	X	B	
Philonthus jurgans Tottenham, 1937		X		N		X	X		
Philonthus laminatus (Creutzer, 1799)	X				N	X		B	
Philonthus longicornis Stephens, 1832		X							
Philonthus micans (Gravenhorst, 1802)	H	X	X	N	N				

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Philonthus nitidicollis (Lacordaire, 1835)						X	X	B	
Philonthus oblitus Jarrige, 1951		B							
Philonthus paganettii Linke, 1915 [E]							X	B	
Philonthus parvicornis (Gravenhorst, 1802)	X	X	X		N	N			
Philonthus politus (Linnaeus, 1758)	H	X				X	X		
Philonthus punctus punctus (Gravenhorst, 1802)			X	N					
Philonthus quisquiliarius quisquiliarius (Gyllenhal, 1810)		N	X	B	N	N	X	N	
Philonthus rectangulus Sharp, 1874			X	N		X	X	B	
Philonthus rubripennis Stephens, 1832					N				
Philonthus rufimanus rufimanus Erichson, 1840					N		X	B	
Philonthus sanguinolentus (Gravenhorst, 1802)			X						
Philonthus spinipes kabardensis (Bolov & Kryzhanovskij, 1969)					N				
Philonthus splendens splendens (Fabricius, 1792)	X								
Philonthus succicola C.G. Thomson, 1860		X		N	N			B	
Philonthus tenuicornis Mulsant & Rey, 1853		X						B	
Philonthus umbratilis (Gravenhorst, 1802)	X		X		N	N		B	
Philonthus varians (Paykull, 1789)						X	X		
Philonthus ventralis (Gravenhorst, 1802)	H	N							
Quediina Kraatz, 1857									
Acylophorus glaberrimus (Herbst, 1784)			X						
Euryporus aeneiventris P.H. Lucas, 1849								B	
Euryporus picipes (Paykull, 1800)	X								
Quedius abietum Kiesenwetter, 1858					B	X	X	B	VU
Quedius aetolicus Kraatz, 1858						N			VU
Quedius aspromontanus Bernhauer, 1908	X			B	B	X	X	B	
Quedius boops boops (Gravenhorst, 1802)	H		X	N	N	X	X	N	
Quedius bruttius Zanetti, 1977 [E]						X	X	B	
Quedius cinctus (Paykull, 1790)	H	X	X	B	N	X	X	B	
Quedius crassus Fairmaire, 1860					N				
Quedius cruentus (A.G. Olivier, 1795)	X			N	N	X	X	B	LC
Quedius curtipennis Bernhauer, 1908	B		X	N	N				
Quedius curtus Erichson, 1840						X			
Quedius cyanescens Mulsant & Rey, 1876								N	
Quedius dilatatus (Fabricius, 1787)		X							
Quedius dubius dubius (Heer, 1839)						X	X		
Quedius fulgidus fulgidus (Fabricius, 1792)				B	B	X			
Quedius fumatus (Stephens, 1833)	H	X		N	N	N	N	B	
Quedius humeralis Stephens, 1832	B				N	X		N	
Quedius invreae Gridelli, 1924			X		N				
Quedius italicus Gridelli, 1925						X		N	
Quedius latialis Gridelli, 1924 [E]	X				N	X	B		
Quedius latinus Gridelli, 1938	X	X	X	N	N	X	X	B	
Quedius levicollis (Brullé, 1832)	H	X	X	B	N	X	X	B	
Quedius lucidulus Erichson, 1839								B	
Quedius masoni Zanetti, 1992	B	B		B	B	B	B	B	
Quedius meridiocarpathicus Smetana, 1958			N						
Quedius mesomelinus silensis Fiori, 1894 [E]	H				N	X	X	B	
Quedius molochinus (Gravenhorst, 1806)	X								
Quedius nemoralis nemoralis Baudi di Selve, 1848		X				X	X	B	
Quedius nigriceps Kraatz, 1857					N	N	X?		
Quedius nigrocaeruleus Fauvel, 1876			N	B	N	X	X	N	
Quedius nitipennis (Stephens, 1833)		X	X		N	N		N	
Quedius obscuripennis Bernhauer, 1901	X				N	X	X		

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Quedius ochripennis (Ménétriés, 1832)	H	X		B	N	X		N	
Quedius pallipes P.H. Lucas, 1846	X	X	X	N		N		B	
Quedius paradisianus (Heer, 1839)						X			
Quedius picipes (Mannerheim, 1830)	H		N	B	N	X		B	
Quedius reitteri Gridelli, 1925						N			
Quedius satanas Bernhauer, 1899	X								
Quedius scintillans (Gravenhorst, 1806)	H	X				X	X	B	
Quedius semiaeneus (Stephens, 1833)	H	X				X	X		
Quedius semiobscurus (Marsham, 1802)	H					N		N	
Quedius suturalis suturalis Kiesenwetter, 1845					N	N			
Quedius truncicola Fairmaire & Laboulbène, 1856						X			VU
Quedius umbrinus Erichson, 1839					N				
Staphylinina Latreille, 1802									
Creophilus maxillosus maxillosus (Linnaeus, 1758)	X	X			N	X	X	N	
Dinothenarus flavocephalus flavocephalus (Goeze, 1777)				B	B	B			
Dinothenarus fossor (Scopoli, 1771)						B	X		
Dinothenarus pubescens pubescens (DeGeer, 1774)							B		
Emus hirtus (Linnaeus, 1758)	H				B	N	B	B	
Ocypus fortunatarum Wollaston, 1871	B							B	
Ocypus fulvipennis Erichson, 1840	B				B	X	B	B	
Ocypus italicus (Aragona, 1830) [E]	H	X	N	B	B	X	X	B	
Ocypus mus (Brullé, 1832)	B				B	N	X	B	
Ocypus nitens nitens (Schrank, 1781)	B	X		N	N	B	B	B	
Ocypus olens (O.F. Müller, 1764)	H	X	N	N	B	X	X	B	
Ocypus ophthalmicus ophthalmicus (Scopoli, 1763)	H	X		N	B	X	CK	B	
Ocypus picipennis picipennis (Fabricius, 1792)	H				CK	X			
Ocypus sericeicollis (Ménétriés, 1832)	H	N		B	B	B	B	B	
Ontholestes murinus (Linnaeus, 1758)	H	X	X	B	B	X	X	N	
Platydracus flavopunctatus (Latreille, 1804)					CK	B			
Platydracus fulvipes (Scopoli, 1763)		B	X						
Platydracus stercorarius stercorarius (A.G. Olivier, 1795)	X	CK			N	B			
Staphylinus caesareus Cederhjelm, 1798	X	X			N			B	
Staphylinus dimidiaticornis Gemminger, 1851		B	X			B	B	B	
Tasgius falcifer falcifer (Nordmann, 1837)		X		N	B	N		B	
Tasgius globulifer globulifer (Geoffroy, 1785)	H	X				X	X		
Tasgius morsitans (P. Rossi, 1790)	X	B		N	N	X	B	B	
Tasgius pedator pedator (Gravenhorst, 1802)	X					B		B	
Tasgius winkleri (Bernhauer, 1906)	B	X		B		N		B	
Tanygnathinina Reitter, 1909									
Astrapaeus ulmi (P. Rossi, 1790)	X	X			N			N	
Quedionuchus plagiatus (Mannerheim, 1843)						N			LC
Xantholinini Erichson, 1839									
Gauropterus fulgidus (Fabricius, 1787)	H	X	N		N	N		B	
Gyrohypnus angustatus Stephens, 1833	H		X	N	N	X	X	N	
Gyrohypnus fracticornis (O.F. Müller, 1776)		X	X	N		X	X		
Gyrohypnus punctulatus (Paykull, 1789)	H					X		B	
Hypnogyra angularis (Ganglbauer, 1895)		N					X		LC
Leptacinus batychrus (Gyllenhal, 1827)		X	X		B			N	
Leptacinus intermedius Donisthorpe, 1936		N	X		N	N		N	
Leptacinus othioides Baudi di Selve, 1870	X		X						
Leptacinus pusillus (Stephens, 1833)			B					B	
Megalinus glabratus (Gravenhorst, 1802)	X	X			N	N		B	
Nudobius collaris (Erichson, 1839)							X		NT

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Phacophallus parumpunctatus (Gyllenhal, 1827)	X	X	X	N		N		B	
Stenistoderus cephalotes cephalotes (Kraatz, 1858)							B		
Stenistoderus nothus (Erichson, 1839)	H	X	X					N	
Vulda garganica (Bernhauer, 1908) [E]	H								
Vulda sbordonii Pace, 1979 [E]	X								
Xantholinus appenninicola Steel, 1946		X		N	N	X	X	B	
Xantholinus audrasi Coiffait, 1956			X						
Xantholinus cerrutii Coiffait, 1964 [E]						B			
Xantholinus elegans (A.G. Olivier, 1795)						X			
Xantholinus graecus Kraatz, 1858								B	
Xantholinus linearis linearis (A.G. Olivier, 1795)	H		X		N	N		B	
Xantholinus longiventris Heer, 1839			X	B					
Xantholinus proceroides Coiffait, 1971 [E]	X	N	X	N	N	N		B	
Xantholinus rufipennis Erichson, 1839	B							B	
SCARABAEIFORMIA Crowson, 1960									
SCARABAEOIDEA Latreille, 1802									
GEOTRUPIDAE Latreille, 1802									
Bolboceratinae Mulsant, 1842									
Odonteini Shokhin, 2007									
Král, Löbl & Nikolajev in Cat. Pal. Col., vol. 3, 2016									
Odonteus armiger (Scopoli, 1772)		B							
Geotrupinae Latreille, 1802									
Enoplotrupini Paulian, 1945									
Nikolajev, Král & Bezděk in Cat. Pal. Col., vol. 3, 2016									
Typhaeus typhoeus (Linnaeus, 1758)	H	X	X			X	X	B	
Geotrupini Latreille, 1802									
Anoplotrupes stercorosus (L.G. Scriba, 1791)	X			N			X	B	
Geotrupes mutator (Marsham, 1802)								N	
Geotrupes spiniger (Marsham, 1802)	H	X	X		N	X	X	N	
Jekelius brullei brullei (Jekel, 1866)	H								
Jekelius intermedius (O.G. Costa, 1839)	B	X		N	N	N		B	
Sericotrupes niger (Marsham, 1802)	H	B	X	N	N	X	X	B	
Trypocopris pyrenaeus cyanicolor (Capra, 1930) [E]				B	N	N	X		
Trypocopris pyrenaeus splendens (Heer, 1841)	H								
Trypocopris vernalis apenninicus Mariani, 1958 [E]				N	N	X	X	B	
TROGIDAE W.S. Macleay, 1819									
Troginae W.S. Macleay, 1819									
Pittino & Bezděk in Cat. Pal. Col., vol. 3, 2016									
Trox litoralis Pittino, 1991		B							
Trox niger P. Rossi, 1792	H	X			N	X		N	
LUCANIDAE Latreille, 1804									
Aesalinae W.S. Macleay, 1819									
Aesalini W.S. Macleay, 1819									
Bartolozzi, Sprecher-Uebersax & Bezděk, in Cat. Pal. Col., vol. 3, 2016									
Aesalus scarabaeoides meridionalis Bartolozzi, 1989 [E]		B							CR
Sinodendrini LeConte, 1861									
Sinodendron cylindricum (Linnaeus, 1758)	B	X		N	B	X	X	B	LC
Lucaninae Latreille, 1804									
Dorcini Parry, 1864									
Dorcus parallelipipedus (Linnaeus, 1758)	X	X		B	CK	X	X	B	LC

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Lucanini Latreille, 1804									
Lucanus tetraodon tetraodon Thunberg, 1806	X	X	X	N	B	X	X	B	LC
Platycerini Mulsant, 1842									
Platycerus caprea (DeGeer, 1774)				B	B	X	B		LC
Platycerus caraboides (Linnaeus, 1758)		N			CK	X	X	B	LC
OCHODAEIDAE Mulsant & Rey, 1871									
Ochodaeinae Mulsant & Rey, 1871									
Ochodaeini Mulsant & Rey, 1871									
Nikolajev & Bezděk in Cat. Pal. Col., vol. 3, 2016									
Ochodaeus chrysomeloides (Schrank, 1781)		X							
Ochodaeus cychramoides Reitter, 1892 [E]		B							
HYBOSORIDAE Erichson, 1847									
Hybosorinae Erichson, 1847									
Ballerio & Bezděk in Cat. Pal. Col., vol. 3, 2016									
Hybosorus illigeri Reiche, 1853		B	X					N	
SCARABAEIDAE Latreille, 1802									
Aphodiinae Leach, 1815									
Aphodiini Leach, 1815									
Aphodiina Leach, 1815									
M. & G. Dellacasa, Král & Bezděk in Cat. Pal. Col., vol. 3, 2016									
Acanthobodilus immundus (Creutzer, 1799)	H	X	X			X		B	
Acrossus depressus (Kugelann, 1792)	X			N	N	X		B	
Acrossus laticollis (Baudi di Selve, 1870)				N	N	X	X	B	
Acrossus luridus (Fabricius, 1775)	H	X	X	N		N	X	B	
Acrossus rufipes (Linnaeus, 1758)	X			N	N	X	X	B	
Acrossus siculus buturensis (G. Dellacasa, 1983) [E]						X	X	B	
Agoliinus ragusae (Reitter, 1892) [E]					B	X			
Agrilinus ater (DeGeer, 1774)				B				B	
Agrilinus constans (Duftschmid, 1805)	X							B	
Agrilinus convexus (Erichson, 1848)				B	B		B	B	
Agrilinus ibericus basilicatus (A. Fiori, 1907)				B	B				
Alocoderus hydrochaeris (Fabricius, 1798)								B	
Amidorus obscurus obscurus (Fabricius, 1792)				B		X	X		
Amidorus thermicola (Sturm, 1800)					B				
Aphodius coniugatus (Panzer, 1795)				B	N	X	X	B	
Aphodius fimetarius (Linnaeus, 1758) s.l.	H	X	X	N	N	X	X	B	
Aphodius foetidus (Herbst, 1783)	H		X	N	N	X	X	B	
Biralus mahunkaorum Ádám, 1983	X					N		B	
Bodiloides ictericus ghardimaouensis (Balthasar, 1929)	H	X	X		N	X	X	B	
Bodilopsis rufa (Moll, 1782)		B	X	N		X	X	N	
Bodilus beduinus (Reitter, 1892)		X				X	X		
Bodilus lugens (Creutzer, 1799)	H				B	X	X	B	
Calamosternus granarius (Linnaeus, 1767)	H	X		N	N	X	X	N	
Calamosternus mayeri (Pilleri, 1953)	B	X							
Chilothorax conspurcatus (Linnaeus, 1758)						X			
Chilothorax distinctus distinctus (O.F. Müller, 1776)							X		
Chilothorax lineolatus (Illiger, 1803)	H	X	N	N		N		B	
Chilothorax paykulli (Bedel, 1908)							X		
Colobopterus erraticus (Linnaeus, 1758)	H	X	X	N	N	X	X	B	
Coprimorphus scrutator (Herbst, 1789)				N	N	X	X	B	
Erytus aequalis (A. Schmidt, 1907)								B	

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Esymus merdarius (Fabricius, 1775)	H			B	N	B	X	B	
Esymus pusillus pusillus (Herbst, 1789)	H	X		N	B	X	X	B	
Eudolus quadriguttatus (Herbst, 1783)	B	X				N		B	
Euheptaulacus carinatus carinatus (Germar, 1824)	X				N	X	X	B	
Euorodalus paracoenosus (Balthasar & Hrubant, 1960)	X						X	B	
Euorodalus tersus (Erichson, 1848)		X						B	
Labarrus lividus (A.G. Olivier, 1789)	X	X				CK		B	
Limarus zenkeri (Germar, 1813)	X			B		X	X	B	
Liothorax niger (Illiger, 1798)					B	X	X	N	
Loraphodius suarius (Faldermann, 1835)						N			
Mecynodes striatulus (Waltl, 1835)	N							B	
Melinopterus consputus (Creutzer, 1799)				N	N	X	X	B	
Melinopterus prodromus (Brahm, 1790)	H		N	N	N	N	X	B	
Melinopterus reyi (Reitter, 1892)					B	B		B	
Melinopterus sphacelatus sphacelatus (Panzer, 1798)					N	X	X	B	
Melinopterus stolzi (Reitter, 1906)				B	N				
Neagolius schlumbergeri samniticus (J. Daniel, 1902) [E]						X			
Nialus varians (Duftschmid, 1805)	H	X	X	N				B	
Nimbus contaminatus (Herbst, 1783)				N		X	X		
Nimbus johnsoni (Baraud, 1976)					N			N	
Nimbus obliteratus (Panzer, 1823)	H			N	N	N	X	B	
Otophorus haemorrhoidalis (Linnaeus, 1758)	H	X		N	N	X	X	B	
Oxyomus sylvestris (Scopoli, 1763)		N						B	
Parammoecius corvinus (Erichson, 1848)				N		X	X	N	
Phalacronothus biguttatus (Germar, 1824)		B		B				B	
Phalacronothus quadrimaculatus (Linnaeus, 1760)	X			B	B		X	B	
Plagiogonus arenarius (A.G. Olivier, 1789)	B							B	
Planolinoides borealis (Gyllenhal, 1827)	H	X		B	B	X	X	B	
Planolinus fasciatus (A.G. Olivier, 1789)	H			B		X	X		
Pseudacrossus suffertus (A. Schmidt, 1916)	B				B		X	B	
Sigorus porcus (Fabricius, 1792)					N	X	X	B	
Subrinus sturmi (Harold, 1870)	H	X		N	N	X	X	N	
Teuchestes fossor (Linnaeus, 1758)					N	X	X		
Trichonotulus scrofa (Fabricius, 1787)	H	X			N			B	
Volinus sticticus (Panzer, 1798)	H			B	N	X	N	B	

Psammodiini Mulsant, 1842

Psammodiina Mulsant, 1842

Racovič, Král & Bezděk in Cat. Pal. Col., vol. 3, 2016

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Brindalus porcicollis (Illiger, 1803)	X	X						N	
Psammodius asper (Fabricius, 1775)		X							
Psammodius basalis (Mulsant & Rey, 1870)	X							B	
Psammodius laevipennis A. Costa, 1844		X						B	
Psammodius nocturnus Reitter, 1892	X								
Psammodius pierottii Pittino, 1979	B	X							

Rhyssemina Pittino & Mariani, 1986

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Pleurophorus caesus (Panzer, 1796)	H	X	X	B	N	X	X	B	
Pleurophorus mediterranicus Pittino & Mariani, 1986		B							
Rhyssemus annaedicatus Pierotti, 1980		B			B			N	
Rhyssemus germanus (Linnaeus, 1767) s.l.	N	X						N	
Rhyssemus parallelus Reitter, 1892	X	X						N	
Rhyssemus sulcatus (A.G. Olivier, 1789)	B								
Trichiorhyssemus dalmatinus Petrovitz, 1967		B							

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Scarabaeinae Latreille, 1802									
Coprini Leach, 1815									
Král & Bezděk in Cat. Pal. Col., vol. 3, 2016									
Copris hispanus cavolinii (V. Petagna, 1792)	X	X	X		N			N	
Copris lunaris (Linnaeus, 1758)	H	X		N	N	X		N	
Copris umbilicatus Abeille de Perrin, 1901	B				N	X			
Gymnopleurini Lacordaire, 1856									
Bezděk in Cat. Pal. Col., vol. 3, 2016									
Gymnopleurus flagellatus flagellatus (Fabricius, 1787)		B					X	B	
Gymnopleurus geoffroyi (Fuessly, 1775)	X	X		N		X			
Gymnopleurus mopsus mopsus (Pallas, 1781)	X	X			N	X		B	
Gymnopleurus sturmii (W.S. Macleay, 1821)	H	X	N		N	X		B	
Oniticellini H.J. Kolbe, 1905									
Oniticellina H.J. Kolbe, 1905									
Bezděk in Cat. Pal. Col., vol. 3, 2016									
Euoniticellus fulvus (Goeze, 1777)	H	X	X	N	N	X	X	B	
Euoniticellus intermedius (Reiche, 1850)							X		
Euoniticellus pallipes (Fabricius, 1781)		X			N			N	
Onitini Laporte, 1840									
Bezděk in Cat. Pal. Col., vol. 3, 2016									
Bubas bison (Linnaeus, 1767)	H	X	X					N	
Cheironitis furcifer (P. Rossi, 1792)	B	B		N	N	X		B	
Cheironitis irroratus (P. Rossi, 1790)		X					B	B	
Onthophagini Burmeister, 1846									
Ziani & Bezděk in Cat. Pal. Col., vol. 3, 2016									
Caccobius schreberi (Linnaeus, 1767)	H	X	X	N	N	X	X	B	
Euonthophagus amyntas amyntas (A.G. Olivier, 1789)	H				N	X		B	
Onthophagus andalusicus andalusicus Waltl, 1835	B	B						B	
Onthophagus coenobita (Herbst, 1783)	B	X			N	N			
Onthophagus fracticornis (Preyssler, 1790)	H			N	N	X	X	B	
Onthophagus furcatus (Fabricius, 1781)	B	X		N		X	X	B	
Onthophagus grossepunctatus Reitter, 1905	H	X		B	N	X	X	B	
Onthophagus illyricus (Scopoli, 1763)		B				X	X	B	
Onthophagus joannae Goljan, 1953		X		B	N	X	X		
Onthophagus lemur (Fabricius, 1781)	H				N	X	X	B	
Onthophagus maki (Illiger, 1803)	X				N	X		B	
Onthophagus opacicollis Reitter, 1892	B	X		N	N	X	X	CK	
Onthophagus ovatus (Linnaeus, 1767)	H							B	
Onthophagus ruficapillus Brullé, 1832	X	X	X	N	N	X	X	N	
Onthophagus semicornis (Panzer, 1798)					B				
Onthophagus taurus (Schreber, 1759)	B	X	X	N	N	X	X	B	
Onthophagus vacca (Linnaeus, 1767)	H	X	X	N	N	X	X	B	
Onthophagus verticicornis (Laicharting, 1781)	H	X		N		X	X		
Scarabaeini Latreille, 1802									
Král & Bezděk in Cat. Pal. Col., vol. 3, 2016									
Ateuchetus semipunctatus (Fabricius, 1792)	X	X				X	X	B	
Ateuchetus variolosus (Fabricius, 1787)	H	X		N	N	X	X	B	
Scarabaeus sacer Linnaeus, 1758	H	X						B	
Scarabaeus typhon (Fischer von Waldheim, 1823)	H	X		N	B	X	X	B	
Sisyphini Mulsant, 1842									
Bezděk in Cat. Pal. Col., vol. 3, 2016									
Sisyphus schaefferi schaefferi (Linnaeus, 1758)	H	X		N	N	X	X	B	

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Orphninae Erichson, 1847 **Orphnini** Erichson, 1847 Bezděk in Cat. Pal. Col., vol. 3, 2016									
Chaetonyx robustus italicus Mariani, 1946 [E]	H			B			X		
Melolonthinae Leach, 1819 **Hopliini** Latreille, 1829 Bezděk in Cat. Pal. Col., vol. 3, 2016									
Hoplia argentea (Poda von Neuhaus, 1761)	X				N	X	X		
Hoplia meridiana Uliana, Liberto & Leo, 2017 [E]		X							
Hoplia minuta (Panzer, 1789) [E]		X		N	N	X		B	
Hoplia paganettii G. Müller, 1907 [E]								B	
Melolonthini Leach, 1819 Bezděk in Cat. Pal. Col., vol. 3, 2016									
Anoxia matutinalis matutinalis Laporte, 1832	X	X	X			N	X	B	
Anoxia orientalis (Krynicki, 1832)								B	
Anoxia scutellaris scutellaris Mulsant, 1842		B			B	X			
Melolontha melolontha (Linnaeus, 1758)							X	B	
Melolontha pectoralis Megerle von Mühlfeld, 1812	H		X	B		N	X	B	
Polyphylla fullo fullo (Linnaeus, 1758)	X	X			B	X		B	
Pachypodini Erichson, 1840 Bezděk in Cat. Pal. Col., vol. 3, 2016									
Pachypus candidae (V. Petagna, 1787)		X						B	
Rhizotrogini Burmeister, 1855 Bezděk in Cat. Pal. Col., vol. 3, 2016									
Amadotrogus quercanum (Burmeister, 1855)		B					X		
Amphimallon assimile (Herbst, 1790)	H	X					X	N	
Amphimallon fuscum (Scopoli, 1786)					B	X	X		
Amphimallon javeti Stierlin, 1864 [E]								B	
Amphimallon ochraceum Knoch, 1801						N	B		
Amphimallon pseudomajale Sabatinelli, 1977 [E]							X		
Amphimallon solstitiale solstitiale (Linnaeus, 1758)				N	N	X	X	B	
Amphimallon vitalei Luigioni, 1932 [E]								B	
Firminus ciliatus vexillis (Reitter, 1902) [E]	H	X					X		
Haplidia etrusca (Kraatz, 1882) [E]	X	X							
Haplidia transversa transversa (Fabricius, 1801)	X								
Holochelus fraxinicola (Hagenbach, 1825)	H								
Rhizotrogus aestivus (A.G. Olivier, 1789)					N	X	X	B	
Sericini Kirby, 1837 Ahrens & Bezděk in Cat. Pal. Col., vol. 3, 2016									
Omaloplia ruricola nicolasi (Baraud, 1965)					N	X	X		
Triodontella nitidula (P. Rossi, 1790)		X			N			B	
Rutelinae W.S. Macleay, 1819 Zorn & Bezděk in Cat. Pal. Col., vol. 3, 2016									
Anisoplia monticola marginata Kraatz, 1883 [E]							X	B	
Anisoplia monticola monticola Erichson, 1847		B		N	N	X			
Anisoplia sabatinellii Baraud, 1991 [E]	B						B		
Anisoplia tempestiva Erichson, 1847	H	X		N		X	X		
Anomala ausonia Erichson, 1847	X	X			N			B	
Exomala leonii (Luigioni, 1932) [E]						B			
Mimela junii calabrica Machatschke, 1957 [E]		X		B	N	X	X	B	

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Dynastinae W.S. Macleay, 1819									
Oryctini Mulsant, 1842									
Krell & Bezděk in Cat. Pal. Col., vol. 3, 2016									
Oryctes nasicornis corniculatus A. Villa & G.B. Villa, 1833	X	X	X	N	N	X	X	N	LC
Pentodontini Mulsant, 1842									
Calicnemis latreillii Laporte, 1832		B						B	VU
Pentodon bidens punctatus (Villers, 1789)	H	X	X	N	N	X	X	B	
Phyllognathus excavatus (Forster, 1771)	B	X				N		N	
Cetoniinae Leach, 1815									
Cetoniini Leach, 1815									
Cetoniina Leach, 1815									
Bezděk in Cat. Pal. Col., vol. 3, 2016									
Aethiessa floralis squamosa (Gory & Percheron, 1833) [E]								B	NT
Cetonia aurata pisana Heer, 1841	H	X	X	B	N	X	X	B	LC
Oxythyrea funesta (Poda von Neuhaus, 1761)	H	X	X	B	N	X	X	B	
Protaetia affinis affinis (Andersch, 1797)	X	B							LC
Protaetia cuprea cuprea (Fabricius, 1775)	H	X			N		X	B	LC
Protaetia morio morio (Fabricius, 1781)	H	X	X	N	N	X			
Protaetia speciosissima (Scopoli, 1786)	X				N			N	LC
Protaetia squamosa crassicollis Burmeister, 1842 [E]	B							B	VU
Tropinota hirta hirta (Poda von Neuhaus, 1761)	H	X	X	N	N	X	X	N	
Tropinota squalida squalida (Scopoli, 1783)	H	X	X	N	N	X	X	B	
Osmodermatini Schenkling, 1922									
Osmoderma italicum Sparacio, 2001 [E]					B	B	B	CK	EN
Trichiini Fleming, 1821									
Trichiina Fleming, 1821									
Gnorimus nobilis nobilis (Linnaeus, 1758)				N	N	X	X	B	NT
Gnorimus variabilis (Linnaeus, 1758)		X			B	N	B		VU
Trichius fasciatus (Linnaeus, 1758)					N	X			LC
Trichius gallicus gallicus Dejean, 1821				N	N	X	X	B	LC
Valgini Mulsant, 1842									
Valgus hemipterus hemipterus (Linnaeus, 1758)	X	X	X	B	N	X	X	N	LC
ELATERIFORMIA Crowson, 1960									
SCIRTOIDEA Fleming, 1821									
EUCINETIDAE Lacordaire, 1857									
Löbl in Cat. Pal. Col., vol. 3, 2016									
Eucinetus haemorrhoidalis (Germar, 1818)		X	X			X	X	N	
Nycteus hopffgarteni prospector Vit, 1985							B	B	
CLAMBIDAE Fischer von Waldheim, 1821									
Calyptomerinae Crowson, 1955									
Löbl in Cat. Pal. Col., vol. 3, 2016									
Calyptomerus dubius (Marsham, 1802)	H	X					X	B	LC
Clambinae Fischer von Waldheim, 1821									
Clambus caucasus Endrödy-Younga, 1960						N			DD
Clambus dux dux Endrödy-Younga, 1960		X	X	N		N			LC
Clambus hayekae Endrödy-Younga, 1960		N							DD
Clambus minutus complicans Wollaston, 1864								B	LC
Clambus minutus minutus (Sturm, 1807)	H	X	X	N		N	X		LC
Clambus nigrellus Reitter, 1914								N	DD
Clambus nigriclavis Stephens, 1835			X			N			DD

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L..	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Clambus pallidulus pallidulus Reitter, 1911	X	N			N	X		B	LC
Clambus pubescens L. Redtenbacher, 1847			X						LC
Clambus punctulum (L. Beck, 1817)	X	N			N	N			LC
Loricaster testaceus pumilus Reitter, 1884	X	N		N	N	X	X	N	LC
SCIRTIDAE Fleming, 1821 **Scirtinae** Fleming, 1821 Klausnitzet in Cat. Pal. Col., vol. 3, 2016									
Contacyphon coarctatus (Paykull, 1799)	H	X		N	N	N	X	N	
Contacyphon laevipennis (Tournier, 1868)		X	N	N	N				
Contacyphon ochraceus ochraceus (Stephens, 1830)		N		N		N		N	
Contacyphon padi (Linnaeus, 1758)	H	N	X						
Contacyphon palmi (Nyholm, 1948)					N	X		N	
Contacyphon palustris (C.G. Thomson, 1855)		X	X	N	N	X	X	N	
Contacyphon unguiculatus Nyholm, 1949 [E]			X			X	X		
Contacyphon variabilis (Thunberg, 1787)	H								
Elodes angelinii (Klausnitzer, 1987) [E]					B	B	X		
Elodes denticulatus (Klausnitzer, 1973) [E]				N	N	N	X	N	
Elodes minutus (Linnaeus, 1767)		X							
Hydrocyphon deflexicollis (P.W.J. Müller, 1821)								N	
Hydrocyphon hydrocyphonoides (Tournier, 1868)		N						B	
Microcara pilosula Reitter, 1911 [E]			X	N	N	X	X	N	
Odeles marginata (Fabricius, 1798)							X		
Prionocyphon serricornis (P.W.J. Müller, 1821)		N			N				NT
Scirtes hemisphaericus (Linnaeus, 1758)					N				
Scirtes orbicularis (Panzer, 1793)	H								
DASCILLOIDEA Guérin-Méneville, 1843									
DASCILLIDAE Guérin-Méneville, 1843 **Dascillinae** Guérin-Méneville, 1843 **Dascillini** Guérin-Méneville, 1843 Hájek in Cat. Pal. Col., vol. 3, 2016									
Dascillus cervinus (Linnaeus, 1758)	B				B	X	X	B	
BUPRESTOIDEA Leach, 1815									
BUPRESTIDAE Leach, 1815 **Polycestinae** Lacordaire, 1857 **Acmaeoderini** Kerremans, 1893 Volkovitsh in Cat. Pal. Col., vol. 3, 2016									
Acmaeodera bipunctata bipunctata (A.G. Olivier, 1790)						X	X	CK	LC
Acmaeodera crinita crinita Gory, 1840		X			B	B	CK		EN
Acmaeodera octodecimguttata quattuordecimpunctata (Villers, 1789)					B	B	CK		VU
Acmaeodera pilosellae pilosellae (Bonelli, 1812)	H	X			B	X	X	B	LC
Acmaeodera quadrifasciata quadrifasciata (P. Rossi, 1790)		B			B	X			LC
Acmaeodera tassii Schaefer, 1965 [E]	X				B	X	X		VU
Acmaeoderella adspersula adspersula (Illiger, 1803)	X	X			B	B	B	B	LC
Acmaeoderella circassica (Reitter, 1890)	B	B				B	B	B	
Acmaeoderella discoida (Fabricius, 1787)	X	X		N	N	B	X		
Acmaeoderella flavofasciata flavofasciata (Piller & Mitterpacher, 1783)	H	X	X	B	B	X	X	B	LC
Acmaeoderella lanuginosa lanuginosa (Gyllenhal, 1817)	!	X				!		B	
Acmaeoderella perroti franzinii Curletti & Magnani, 1987		B			N	!		N	
Acmaeoderella virgulata (Illiger, 1803)	H	X				N			

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Ptosimini Kerremans, 1903									
Ptosima undecimmaculata undecimmaculata (Herbst, 1784)	H	X		B	B	X		B	LC
Chrysochroinae Laporte, 1835 **Chalcophorini** Lacordaire, 1857 Kubáň in Cat. Pal. Col., vol. 3, 2016									
Chalcophora intermedia intermedia (Rey, 1890)							X		EN
Chalcophora mariana (Linnaeus, 1758)							X		LC
Chalcophorella fabricii (P. Rossi, 1794)	B	B		B	B	B	B	B	VU
Dicercini Gistel, 1848 Kubáň in Cat. Pal. Col., vol. 3, 2016									
Capnodis cariosa cariosa (Pallas, 1776)	H	X				B		B	LC
Capnodis miliaris miliaris (Klug, 1829)		X				B	B	B	VU
Capnodis tenebricosa tenebricosa (A.G. Olivier, 1790)	H	X			B	B		N	
Capnodis tenebrionis (Linnaeus, 1760)	H	X	X	N	B	B		N	LC
Cyphosoma euphraticum insulare (Kiesenwetter, 1858)		B							NT
Dicerca aenea aenea (Linnaeus, 1760)	X	X			B	N	B	B	LC
Dicerca alni (Fischer von Waldheim, 1824)	X	B		B	!	X	X	B	NT
Dicerca berolinensis (Herbst, 1779)		B							NT
Perotis lugubris lugubris (Fabricius, 1777)	H								LC
Perotis lugubris meridionalis Izzillo & Sparacio, 2011 [E]		B							NT
Poecilonotini Jakobson, 1913 Kubáň in Cat. Pal. Col., vol. 3, 2016									
Lamprodila decipiens decipiens (Gebler, 1847		B			B	B			LC
Lamprodila festiva festiva (Linnaeus, 1767)		B						B	LC
Lamprodila mirifica mirifica (Mulsant, 1855)		X			B			B	LC
Lamprodila solieri (Laporte & Gory, 1837)		X							CR
Poecilonota variolosa variolosa (Paykull, 1799)		X				B	X		LC
Sphenopterini Lacordaire, 1857 Kalashian in Cat. Pal. Col., vol. 3, 2016									
Sphenoptera antiqua antiqua (Illiger, 1803)		B			!	X	B		
Sphenoptera barbarica (Gmelin, 1790)		B				B	B	B	
Sphenoptera gemmata gemmata (A.G. Olivier, 1790		B			B	B			
Sphenoptera laportei E. Saunders, 1871						X	X	B	
Sphenoptera rauca (Fabricius, 1787)		B				B		B	
Buprestinae Leach, 1815 **Anthaxiini** Gory & Laporte, 1839 Kubáň in Cat. Pal. Col., vol. 3, 2016									
Anthaxia anatolica anatolica Chevrolat, 1838	X	X				N			
Anthaxia cichorii (A.G. Olivier, 1790)		B	X	B	B	X	X	B	LC
Anthaxia confusa confusa Gory, 1841	B	B			B		X	N	LC
Anthaxia croesus (Villers, 1789)	H	B			B	X		B	LC
Anthaxia cyanescens Gory, 1841	B				B	X			LC
Anthaxia dimidiata (Thunberg, 1789)	H	X				N		B	LC
Anthaxia fulgurans (Schrank, 1789)		B		B	B	X	X	N	LC
Anthaxia godeti Gory & Laporte, 1839				N	N	X	X	B	LC
Anthaxia hackeri J. Frivaldszky, 1884		B			B				CR
Anthaxia helvetica apennina Obenberger, 1938 [E]					B	X	X	B	LC
Anthaxia hungarica hungarica (Scopoli, 1772)	H	X	X	N	B	X	X	B	LC
Anthaxia hypomelaena (Illiger, 1803)	X	B	N	B	B	X		N	
Anthaxia istriana Rosenhauer, 1847						B	X		LC
Anthaxia kochi Obenberger, 1938 [E]					B	X	X	B	VU
Anthaxia liae Gobbi, 1983 [E]					!	B	X	B	LC

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Anthaxia lucens Küster, 1852	H					B		B	LC
Anthaxia manca (Linnaeus, 1767)	X	B			B		B		LC
Anthaxia mendizabali Cobos, 1965	X	B		N	B	X	X	B	LC
Anthaxia millefolii polychloros Abeille de Perrin, 1894	H	X	X	B	B	X	X	B	LC
Anthaxia nitidula (Linnaeus, 1758)	H	X		B	B	X	X	B	LC
Anthaxia oberthuri Schaefer, 1938	X				B		B		EN
Anthaxia praeclara praeclara Mannerheim, 1837	B								VU
Anthaxia salicis salicis (Fabricius, 1777)	X					B			LC
Anthaxia scylla Levey, 1985						X			LC
Anthaxia semicuprea Küster, 1851	H	X		N	B	X	X	B	LC
Anthaxia senicula senicula (Schrank, 1789)	B	B			B				NT
Anthaxia sepulchralis sepulchralis (Fabricius, 1801)							X		LC
Anthaxia suzannae Théry, 1942	!								LC
Anthaxia thalassophila thalassophila Abeille de Perrin, 1900	X	X	X	B	B	X	X	B	LC
Anthaxia umbellatarum umbellatarum (Fabricius, 1787)	H	X	N	B	B	B	B	B	LC
Buprestini Leach, 1815									
Buprestis cupressi Germar, 1836	B	X							LC
Buprestis haemorrhoidalis haemorrhoidalis Herbst, 1780		B				X	X		LC
Buprestis humeralis Klug, 1829		B							EN
Buprestis novemmaculata novemmaculata Linnaeus, 1767	X					X	X	B	LC
Buprestis octoguttata octoguttata Linnaeus, 1758					B	X			LC
Buprestis splendens splendens Fabricius, 1775						X			EN
Eurythyrea austriaca (Linnaeus, 1767)					N	X	X	B	VU
Eurythyrea micans (Fabricius, 1792)		X					B	B	LC
Eurythyrea quercus (Herbst, 1780)								B	CR
Chrysobothrini Gory & Laporte, 1938									
Chrysobothris affinis affinis (Fabricius, 1794)	X	X		B	B	X	X	B	LC
Chrysobothris chrysostigma chrysostigma (Linnaeus, 1758)						B			LC
Chrysobothris solieri Gory & Laporte, 1837	B	B				B	X		LC
Melanophilini Bedel, 1921									
Melanophila acuminata (DeGeer, 1774)							X		CR
Melanophila cuspidata (Klug, 1829)	B	X			!		B		LC
Phaenops cyanea (Fabricius, 1775)							X		NT
Phaenops knoteki ochsi Schaefer, 1947						X	B	B	VU
Trachypteris picta decostigma (Fabricius, 1787)		X						CK	LC
Agrilinae Laporte, 1835 **Agrilini** Laporte, 1835 **Agrilina** Laporte, 1835 Jendek in Cat. Pal. Col., vol. 3, 2016									
Agrilus albogularis artemisiae C.N.F. Brisout de Barneville, 1863		B				B	B		
Agrilus albomarginatus A. Fiori, 1906	B					!		B	LC
Agrilus angustulus angustulus (Illiger, 1803) [E]	X	X	X	B	B	X	X	N	LC
Agrilus antiquus croaticus Abeille de Perrin, 1897						B	X		LC
Agrilus ater (Linnaeus, 1767)		X				B	B		LC
Agrilus auricollis Kiesenwetter, 1857		B							LC
Agrilus biguttatus (Fabricius, 1777)	CK	N				B	X		LC
Agrilus convexicollis L. Redtenbacher, 1847	H	X	X	B	!	X			LC
Agrilus cuprescens (Ménétriés, 1832)	X	B	X	N	B	X	X	B	
Agrilus cyanescens italicus Obenberger, 1920 [E]		B			B				LC
Agrilus derasofasciatus Lacordaire, 1835	B	B			B				LC
Agrilus graecus Obenberger, 1916					B	B			DD
Agrilus graminis Kiesenwetter, 1857	B	B		B	B	X	X	B	LC

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Agrilus hastulifer (Ratzeburg, 1837)	B			N		X	X		LC
Agrilus hyperici (Creutzer, 1799)	H	B	B	B	B	X	X	N	
Agrilus integerrimus (Ratzeburg, 1837)					B	X		B	
Agrilus laticornis (Illiger, 1803)	H	B		B	B	B	B		LC
Agrilus lineola lineola Kiesenwetter, 1857	X	X			N			N	LC
Agrilus marozzinii Gobbi, 1974	X	X			B				LC
Agrilus obscuricollis Kiesenwetter, 1857	X	X			B	B	X		LC
Agrilus olivicolor Kiesenwetter, 1857		B			B	B	X	B	LC
Agrilus paganettii Obenberger, 1913 [E]		B						B	
Agrilus pratensis (Ratzeburg, 1837)		B				N	X	B	LC
Agrilus relegatus alexeevi Bellamy, 1998	B								LC
Agrilus roscidus Kiesenwetter, 1857	H	X		N	B	B	X	B	LC
Agrilus sinuatus sinuatus (A.G. Olivier, 1790)	H								LC
Agrilus solieri solieri Gory & Laporte, 1837		B			B	B			
Agrilus suvorovi populneus Schaefer, 1946		B				B	B	B	LC
Agrilus viridicaerulans rubi Schaefer, 1937	B	X		B	B	X	B	B	
Agrilus viridis (Linnaeus, 1758)	B	B		N	B	X	X	B	LC
Aphanisticini Jacquelin du Val, 1859 **Aphanisticina** Jacquelin du Val, 1859 Kalashian & Kubáň in Cat. Pal. Col., vol. 3, 2016									
Aphanisticus angustatus P.H. Lucas, 1846	X	X	X	N		N	B	B	
Aphanisticus elongatus elongatus A. Villa & G.B. Villa, 1835			X	N	B	X			
Aphanisticus emarginatus (A.G. Olivier, 1790)		X	N	B	B				
Aphanisticus pygmaeus P.H. Lucas, 1849		X			B				
Cylindromorphus dalmatinus Csiki, 1915	B	B			B				
Cylindromorphus gallicus angelinii Curletti, 1990 [E]		B			N	B			
Coraebini Bedel, 1921 **Amorphosomatina** Majer, 2000 Kubáň in Cat. Pal. Col., vol. 3, 2016									
Coraebus elatus (Fabricius, 1787)	H	X	X	B	B	X	X	N	
Coraebus fasciatus (Villers, 1789)	X	B			B			B	LC
Coraebus rubi (Linnaeus, 1767)	H	X	X	B	B	X	X	B	
Meliboeus amethystinus amethystinus (A.G. Olivier, 1790)		B			B	N	X	B	
Meliboeus episcopalis (Mannerheim, 1837)	X	X		B		B		B	
Meliboeus fulgidicollis (P.H. Lucas, 1846)	X				B	B	X	B	LC
Meliboeus graminis graminis (Panzer, 1789)		X			B	B	X	B	
Meliboeus parvulus (Küster, 1852)		B	X	N	B	X	X	B	
Tracheini Laporte, 1835 **Pachyschelina** Böving & Craighead, 1931 Kubáň in Cat. Pal. Col., vol. 3, 2016									
Habroloma nanum (Paykull, 1799)		B							
Habroloma triangulare (Lacordaire, 1835)		B							
Trachys menthae Bedel, 1921	X			B		X		B	
Trachys minutus minutus (Linnaeus, 1758)	H	X	X	N	B	X	X	B	
Trachys quercicola Marseul, 1871			X			B			
Trachys troglodytes Gyllenhal, 1817	H	X	X	B	B	!	B	B	
Trachys troglodytiformis Obenberger, 1918	B	X		B	B	B	B	B	
BYRRHOIDEA Latreille, 1804									
BYRRHIDAE Latreille, 1804 **Byrrhinae** Latreille, 1804 **Simplocariini** Mulsant & Rey, 1869 Jäger & Pütz in Cat. Pal. Col., vol. 3, 2016									

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Simplocaria semistriata (Fabricius, 1794)					N				
Byrrhini Latreille, 1804									
Byrrhus arietinus arietinus Steffahny, 1842	X								
Byrrhus numidicus Normand, 1935						B		B	
Byrrhus pustulatus pustulatus (Forster, 1771)						X	X		
Byrrhus pilula (Linnaeus, 1758)							X		
Curimus lariensis (A. Villa & G.B. Villa, 1833)						N			DD
Cytilus sericeus (Forster, 1771)							N		
Syncalyptinae Mulsant & Rey, 1869									
Syncalyptini Mulsant & Rey, 1869									
Curimopsis maritima maritima (Marsham, 1802)	H	N			N	N		N	
Curimopsis paleata (Erichson, 1846)			N			N			
ELMIDAE Curtis, 1830									
Elminae Curtis, 1830									
Elmini Curtis, 1830									
Elmina Curtis, 1830									
Jäch & Kodada in Cat. Pal. Col., vol. 3, 2016									
Elmis aenea (P.W.J. Müller, 1806)						N	B	CK	
Elmis maugetii maugetii Latreille, 1802				N	CK	B	B	B	
Elmis rioloides (Kuwert, 1890)					CK			B	
Esolus angustatus (P.W.J. Müller, 1821)					CK	B	X	!	
Esolus berthelemyi Olmi, 1975			X		B	B	B	B	
Esolus parallelepipedus (P.W.J. Müller, 1806)							B		
Limnius intermedius Fairmaire, 1881								B	
Limnius opacus opacus P.W.J. Müller, 1806						X	X	B	
Limnius perrisi perrisi (Dufour, 1843)				N		X	X	B	
Oulimnius tuberculatus (P.W.J. Müller, 1806)						CK			
Riolus cupreus (P.W.J. Müller, 1806)					CK	B			
Riolus subviolaceus (P.W.J. Müller, 1817)						X	X		
DRYOPIDAE Billberg, 1820									
Kodada & Jäch in Cat. Pal. Col., vol. 3, 2016									
Dryops algiricus (P.H. Lucas, 1846)	X	X	X	N	B			CK	
Dryops doderoi Bollow, 1936	X	X							
Dryops ernesti Gozis, 1886					N			B	
Dryops luridus (Erichson, 1847)		X		N		X	X		
Dryops lutulentus (Erichson, 1847)			N				B	CK	
Dryops rufipes (Krynicki, 1832)				!					
Dryops similaris Bollow, 1936						CK			
Dryops striatellus (Fairmaire & C.N.F. Brisout de Barneville, 1859)		X							
Dryops subincanus (Kuwert, 1890)		B	X		CK	!		B	
Dryops sulcipennis (A. Costa, 1883)		CK				X	X		
Dryops viennensis (Laporte, 1840)		!							
Pomatinus substriatus (P.W.J. Müller, 1806)							X	B	
LIMNICHIDAE Erichson, 1846									
Limnichinae Erichson, 1846									
Hernando & Ribera in Cat. Pal. Col., vol. 3, 2016									
Bothriophorus atomus Mulsant & Rey, 1852		B				B		B	
Limnichus incanus Kiesenwetter, 1851		B	X		CK	B		CK	
Limnichus sericeus (Duftschmid, 1825)		CK	N	N		B			
Pelochares versicolor (Waltl, 1838)	CK	CK	X		CK	N		CK	

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
HETEROCERIDAE W.S. Macleay, 1825									
Heterocerinae W.S. Macleay, 1825									
Augylini Pacheco, 1964									
Mascagni in Cat. Pal. Col., vol. 3, 2016									
Augyles flavidus (P. Rossi, 1794)	X	X		N	CK	X			
Augyles maritimus (Guérin-Méneville, 1844)	CK	CK	X	N	CK	N	X	N	
Augyles marmota (Kiesenwetter, 1850)		X				CK		CK	
Heterocerini W.S. Macleay, 1825									
Heterocerus aragonicus Kiesenwetter, 1850					N	CK		B	
Heterocerus fenestratus (Thunberg, 1784)	X	X	X	CK	N	X	X	B	
Heterocerus flexuosus Stephens, 1828	X	X							
Heterocerus holosericeus Rosenhauer, 1856	X	X			CK	CK			
ELATEROIDEA Leach, 1815									
Kundrata et al., 2014									
ARTEMATOPODIDAE Lacordaire, 1857									
Artematopodinae Lacordaire, 1857									
Bocák in Cat. Pal. Col., vol. 4, 2007									
Eurypogon cribratus (Hampe, 1866) [E]					N				
EUCNEMIDAE Eschscholtz, 1829									
Melasinae Fleming, 1821									
Dirhagini Reitter, 1911									
Muona in Cat. Pal. Col., vol. 4, 2007									
Farsus dubius (Piller & Mitterpacher, 1783)	X	X				X	X	N	LC
Microrhagus emyi (Rouget, 1856)							N	N	VU
Microrhagus hummleri (Reitter, 1911)		X				B		B	CR
Microrhagus pygmaeus (Fabricius, 1792)							N		NT
Epiphanini Muona, 1993									
Epiphanis cornutus Eschscholtz, 1829							N		VU
Melasini Fleming, 1821									
Isorhipis melasoides (Laporte, 1835)					B	X	X	N	LC
Melasis buprestoides (Linnaeus, 1761)	X			N		X		B	LC
Xylobiini Reitter, 1911									
Xylophilus corticalis (Paykull, 1800)									NT
THROSCIDAE Laporte, 1840									
Throscinae Laporte, 1840									
Throscini Laporte, 1840									
Leseigneur in Cat. Pal. Col., vol. 4, 2007									
Aulonothroscus brevicollis (Bonvouloir, 1859)			N						DD
Trixagus algiricus (Bonvouloir, 1862)			X	N			N	N	DD
Trixagus angelinii Leseigneur, 2005					N			N	LC
Trixagus atticus Reitter, 1921		B	N						DD
Trixagus carinifrons (Bonvouloir, 1859)					N			N	DD
Trixagus dermestoides (Linnaeus, 1767)					N	N			LC
Trixagus duvalii (Bonvouloir, 1859)		X	X						DD
Trixagus elateroides elateroides (Heer, 1841)		N	X		N	N	N	N	LC
Trixagus exul (Bonvouloir, 1859)					N				
Trixagus gracilis Wollaston, 1854	B	B	B		N	N	N	N	LC
Trixagus meybohmi Leseigneur, 2005								B	NT
Trixagus obtusus (Curtis, 1827)			X		N	N			LC

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
LYCIDAE Laporte, 1838									
Lycinae Laporte, 1838									
Erotini LeConte, 1881									
Bocáková & Bocák in Cat. Pal. Col., vol. 4, 2007									
Dictyoptera aurora (Herbst, 1784)		X					X	B	LC
Platycis minutus (Fabricius, 1787)						X	B	B	LC
Pyropterus nigroruber (DeGeer, 1774)	X	X		N		X	X	N	LC
Calochrominae Lacordaire, 1857									
Lygistopterus anorachilus Ragusa, 1883 [E]	X				B	X	X	N	NT
Lygistopterus sanguineus (Linnaeus, 1758)	X			N	B	X	B	B	LC
LAMPYRIDAE Latreille, 1817									
Lampyrinae Latreille, 1817									
Lampyrini Latreille, 1817									
Geisthardt & Satô in Cat. Pal. Col., vol. 4, 2007									
Lampyris brutia A. Costa, 1882 [E]					N		B		
Lampyris noctiluca (Linnaeus, 1767)	X	X	X			X	X		
Photinini E. Olivier, 1907									
Lamprohiza splendidula (Linnaeus, 1767)						X	X	N	
Luciolinae Lacordaire, 1857									
Luciolini Lacordaire, 1857									
Luciola italica (Linnaeus, 1767)			X		N	X		N	
Luciola lusitanica (Charpentier, 1825)	B	B							
CANTHARIDAE Imhoff, 1856									
Cantharinae Imhoff, 1856									
Podabrini LeConte, 1881									
Kazantsev & Brancucci in Cat. Pal. Col., vol. 4, 2007									
Malthacus procerulus (Kiesenwetter, 1860)				B	N	X	X	B	
Cantharini Imhoff, 1856									
Ancistronycha abdominalis (Fabricius, 1798)							X		
Ancistronycha lucens Moscardini, 1967	X					X	X	B	
Ancistronycha violacea (Paykull, 1798)						X	X	B	
Cantharis corvina Moscardini, 1962 [E]				B					
Cantharis decipiens Baudi di Selve, 1872	X			N	N	X	X	N	
Cantharis falzonii A. Fiori, 1914 [E]					B	X	X	B	
Cantharis flavilabris Fallén, 1807	H	X	N	N	N	X	X	N	
Cantharis fusca Linnaeus, 1758	X	X	N	B	N	X	X	B	
Cantharis ictaria A. Fiori, 1914 [E]							X		
Cantharis italica A. Fiori, 1914 [E]	X			N	N	X	X	B	
Cantharis lateralis Linnaeus, 1758	H	X	N						
Cantharis liburnica Depoli, 1912				B				B	
Cantharis livida Linnaeus, 1758	H	X	X	B	N	X	X	B	
Cantharis merula Moscardini, 1962 [E]	X	X	X	N	B	X	X	B	
Cantharis monacha Moscardini, 1962 [E]							X	N	
Cantharis nigricans (O.F. Müller, 1776)	X	N		N		X	X	N	
Cantharis obscura Linnaeus, 1758						X			
Cantharis paganettii (Flach, 1907) [E]			N	N		X	X	B	
Cantharis pallida Goeze, 1777						X	X	B	
Cantharis pellucida Fabricius, 1792				B		X	X	B	
Cantharis peninsularis A. Fiori, 1914 [E]	X	X		B		X	X	B	
Cantharis rufa Linnaeus, 1758								B	
Cantharis rustica Fallén, 1807	X	X	X	B	N	X	X		

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Cantharis torretassoi Wittmer, 1935 [E]						X			
Cratosilis denticollis (Schummel, 1844)	X	X		N	N	X	X	B	
Cratosilis laeta (Fabricius, 1792)				N		X		B	
Cratosilis sicula (Marseul, 1864) [E]	H	X	X	N	N	X	X	B	
Metacantharis clypeata Illiger, 1798	H	N	X	N	N	X	X	N	
Metacantharis picciolii (Ragusa, 1870) [E]				B	N				
Rhagonycha femoralis (Brullé, 1832)	H	X			B	X	X		
Rhagonycha fulva (Scopoli, 1763)	H	X	X	B	N	X	X	B	
Rhagonycha fuscitibia Rey, 1891		N		N	N	N		N	
Rhagonycha lignosa (O.F. Müller, 1764)	H	N		B	N	X	X	N	
Rhagonycha lutea (O.F. Müller, 1764)						X	X	N	
Rhagonycha nigriceps (Waltl, 1838)	B					N			
Rhagonycha nigrosuta A. Fiori, 1899 [E]	H		X		B	X	X	B	
Silinae Mulsant, 1862 **Silini** Mulsant, 1862									
Silis ruficollis (Fabricius, 1775)	X	X							
Malthininae Kiesenwetter, 1852 **Malthinini** Kiesenwetter, 1852									
Malthinus balteatus Suffrian, 1851	X	X				X		N	
Malthinus deceptor Baudi di Selve, 1893 [E]	X			N	N	N	X	N	
Malthinus devillei Abeille de Perrin, 1898						X			
Malthinus fasciatus (A.G. Olivier, 1790)	H								
Malthinus flaveolus (Herbst, 1786)						X			
Malthinus frontalis (Marsham, 1802						N			
Malthinus garganicus A. Fiori, 1915 [E]	X	N		N	N	N	N	N	
Malthinus glabellus Kiesenwetter, 1852						B		B	
Malthinus insignipes Pic, 1907 [E]						X	N		
Malthinus neapolitanus Pic, 1905 [E]								B	
Malthinus pseudobiguttatus Constantin, 1975					B				
Malthinus reflexus Wittmer, 1974 [E]						N		B	
Malthinus scapularis Marseul, 1878							X	B	
Malthinus scriptus Kiesenwetter, 1852	B								
Malthinus seriepunctatus Kiesenwetter, 1852	H			N	B		N		
Malthinus sordidus sordidus Kiesenwetter, 1871	B					N			
Malthodini Böving & Craighead, 1930									
Malthodes brettius Liberti, 2017 [E]						B			
Malthodes conicus Wittmer, 1970 [E]						B	B		
Malthodes cordigerioides Pic, 1915 [E]						B		B	
Malthodes dispar (Germar, 1824)	X?					B	B		
Malthodes facetus Kiesenwetter, 1863						X	B		
Malthodes freyi Wittmer, 1939 [E]						B			
Malthodes gratiosus Ganglbauer, 1906 [E]	B								
Malthodes hexacanthus Kiesenwetter, 1852				N	N	X	B	N	
Malthodes latistylus Liberti, 2017 [E]						B			
Malthodes lobatus Kiesenwetter, 1852						B			
Malthodes manubriatus Kiesenwetter, 1863 [E]					B	N			
Malthodes marginatus (Latreille, 1806)	B				B				
Malthodes murgianus Pic, 1914 [E]	B			B		B			
Malthodes parthenias Kiesenwetter, 1871 [E]	B	B			B	X	B	B	
Malthodes pinnatus Kiesenwetter, 1871 [E]	H					B	B		
Malthodes pratensis Liberti, 2017 [E]						B	B		
Malthodes rheginus Liberti, 2017 [E]								B	

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Malthodes siculus Kiesenwetter, 1852	B	X			B	N		B	
Malthodes solarii Pic, 1912 [E]					B	X		B	
Malthodes spectabilis Kiesenwetter, 1871 [E]	X	B	N	B	B	B	X		
Malthodes spinifer Liberti, 2017 [E]						B			
Malthodes teter A. Fiori, 1908 [E]					B				
Malthodes umbrosus Kiesenwetter, 1871 [E]						B			
OMALISIDAE Lacordaire, 1857									
Omalisinae Lacordaire, 1857									
Bocák in Cat. Pal. Col., vol. 4, 2007; Kundrata et al., 2015; Bocek et al., 2017									
Omalisus fontisbellaquaei Geoffroy, 1785		N			N				
Thilmaninae Kazantsev, 2005									
Phaeopterus unicolor A. Costa, 1857		N							
ELATERIDAE Leach, 1815									
Agrypninae Candèze, 1857									
Agrypnini Candèze, 1857									
Cate in Cat. Pal. Col., vol. 4, 2007 except Cebrionini and Lissominae; Kundrata et al., 2018									
Agrypnus murinus (Linnaeus, 1758)	H	X		N	CK	X	X	B	
Compsolacon crenicollis (Ménétriés, 1832)		X			CK	X		B	
Lacon lepidopterus (Panzer, 1800)							X		EN
Lacon punctatus punctatus (Herbst, 1779)	H	X	X	N	CK	X	X	N	LC
Drilini Blanchard, 1845									
Drilus flavescens A.G. Olivier, 1790	H	X	X	N	N	X	X	B	
Oophorini Gistel, 1848									
Aeoloderma crucifer (P. Rossi, 1790)		X						B	
Drasterius bimaculatus (P. Rossi, 1790)	H	X	X	CK	CK	X	X	B	
Cardiophorinae Candèze, 1860									
Cardiophorus anticus Erichson, 1840	CK	CK						CK	NT
Cardiophorus castillanus Buysson, 1902				B		X	B		
Cardiophorus collaris Erichson, 1840	X	X	X	CK	CK	X	X	B	
Cardiophorus elenorae (Gené, 1836)								B	
Cardiophorus exaratus exaratus Erichson, 1840	X	X							
Cardiophorus goezei Sanchez-Ruiz, 1996)	H	X		CK	CK	X	X	B	
Cardiophorus gramineus (Scopoli, 1763)	CK								NT
Cardiophorus italicus Platia & Bartolozzi, 1988 [E]	B	B		CK	CK	N	B		
Cardiophorus nathaliae Platia & Schimmel, 1988 [E]		B							
Cardiophorus ruficruris (Brullé, 1832)	CK								
Cardiophorus ulcerosus (Gené, 1836)		X				X	B	CK	
Cardiophorus vestigialis Erichson, 1840	X	X			CK	X	X	B	
Dicronychus cinereus (Herbst, 1784)	H	CK		CK	CK	X	X	CK	
Dicronychus equiseti (Herbst, 1784)	CK	X			CK	X	B		
Dicronychus rubripes (Germar, 1824)	B			B					
Dicronychus versicolor (Mulsant & Guillebeau, 1856)	H			CK	CK	X	X		
Paracardiophorus musculus musculus (Erichson, 1840)		X					X		
Dendrometrinae Gistel, 1848									
Dendrometrini Gistel, 1848									
Athouina Candèze, 1859									
Athous bicolor (Goeze, 1777)					B				
Athous cachecticus Candèze, 1860 [E]					CK	B	X	B	
Athous flavipennis Candèze, 1860					B				
Athous haemorrhoidalis (Fabricius, 1801)	H			N	CK	X	X	B	
Athous ineptus Candèze, 1860					CK	X	X	B	

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Athous limoniiformis Candèze, 1865 [E]								CK	
Athous marginicollis Reitter, 1890						B	X	B	
Athous puncticollis Kiesenwetter, 1858	!				!	!	!	!	
Athous subfuscus (O.F. Müller, 1764)	X			N	CK	X	X	B	
Athous vittatus (Fabricius, 1792)	H	X	X	N	CK	X	X	B	
Athous zappiorum Platia, 1985 [E]					B				
Cidnopus pilosus (Leske, 1785)	!		X		CK	B			
Cidnopus pseudopilosus Platia & Gudenzi, 1985	H		X	CK	B	X	X		
Limonius minutus (Linnaeus, 1758)	H			CK	CK	X	X	B	
Nothodes parvulus (Panzer, 1799)	H			N		X	X	B	
Pheletes quercus (A.G. Olivier, 1790)	X	X		N	CK	X	X		
Dendrometrina Gistel, 1848									
Denticollis rubens Piller & Mitterpacher, 1783						X	X	!	NT
Hemicrepidiina Champion, 1894									
Harminius florentinus (Desbrochers des Loges, 1870)					CK		X		
Harminius spiniger (Candèze, 1860)	X	X	X		N	X	!	!	
Hemicrepidius hirtus (Herbst, 1784)	CK	X	X	B	CK	X	X	B	
Stenagostus rhombeus (A.G. Olivier, 1790)	X					B	!	!	VU
Prosternini Gistel, 1856									
Anostirus cerrutii Binaghi, 1940				N	B	B	X	B	
Aplotarsus incanus (Gyllenhal, 1827)							X		
Calambus bipustulatus (Linnaeus, 1767)	X			CK	CK		CK		VU
Ctenicera cuprea (Fabricius, 1775)					B				
Ctenicera pectinicornis (Linnaeus, 1758)						X	X		
Hypoganus inunctus (Lacordaire, 1835)				CK	B	B	X		EN
Mosotalesus impressus impressus (Fabricius, 1792)						X			
Prosternon tessellatum (Linnaeus, 1758)						X	X	B	
Selatosomini Schimmel, Tarnawski, Han & Platia, 2015									
Pristilophus melancholicus melancholicus (Fabricius, 1798)						X	X	B	
Selatosomus amplicollis (Germar, 1843)	X			N	CK	X	X	CK	
Selatosomus saginatus (Ménétriés, 1832)	H	X			CK	X	X	B	
Elaterinae Leach, 1815									
Agriotini Champion, 1894									
Agriotes acuminatus (Stephens, 1830)			CK		CK	X	X	B	
Agriotes aequalis Schwarz, 1891 [E]					B				
Agriotes brevis Candèze, 1863	X	X	X	CK	CK	X	X	!	
Agriotes corsicus Candèze, 1863	!				CK	X	X	B	
Agriotes infuscatus Desbrochers des Loges, 1870	H		X	CK	CK	X	X	B	
Agriotes lineatus (Linnaeus, 1767)	X	X	X		CK	X	X	B	
Agriotes litigiosus (P. Rossi, 1792)	X		X		CK	X	X	B	
Agriotes modestus Kiesenwetter, 1858		X							
Agriotes proximus Schwarz, 1891	B		B						
Agriotes sordidus (Illiger, 1807)	H	X	X		CK			CK	
Dalopius marginatus (Linnaeus, 1758)	H			N	CK	X	X	B	
Ampedini Gistel, 1856									
Ampedus cardinalis (Schiödte, 1865)		B					X		LC
Ampedus cinnaberinus (Eschscholtz, 1829)				N	CK	X	X	B	LC
Ampedus coenobita (A. Costa, 1881)							X	B	NT
Ampedus elegantulus (Schönherr, 1817)						X	X		VU
Ampedus erythrogonus (P.W.J. Müller, 1821)						B	X		NT
Ampedus glycereus (Herbst, 1784)	H			CK		B	B	B	LC
Ampedus magistrettii Platia & Schimmel, 1988 [E]	B					X			EN

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Ampedus melanurus Mulsant & Guillebeau, 1855						X		B	VU
Ampedus nemoralis Bouwer, 1980		B							VU
Ampedus nigerrimus (Lacordaire, 1835)					CK			!	LC
Ampedus pomonae (Stephens, 1830)	B								NT
Ampedus pomorum (Herbst, 1784)	H	B				X	X	B	LC
Ampedus praeustus (Fabricius, 1792)	X						X		NT
Ampedus quadrisignatus (Gyllenhal, 1817)		X							CR
Ampedus quercicola (Buysson, 1887)	B				B	CK	X	B	LC
Ampedus rufipennis (Stephens, 1830)	H	B		B	B	X	X	B	VU
Ampedus sanguineus (Linnaeus, 1758)	X	X				X	X	B	LC
Ampedus sanguinolentus sanguinolentus (Schrank, 1776)		X					X		LC
Ampedus sinuatus Germar, 1844						X	X	B	VU
Brachygonus megerlei (Lacordaire, 1835)		B						!	VU
Reitterelater bouyoni (Chassain, 1992)						CK			CR
Cebrionini Latreille, 1802									
Sánchez-Ruiz & Löbl in Cat. Pal. Col., vol. 4, 2007; Kundrata & Bocák, 2011									
Cebrio dubius P. Rossi, 1790 [E]	X?								
Cebrio fiorii Leoni, 1906 cf. [E]		B	X	B		X	X?		
Elaterini Leach, 1815									
Elaterina Leach, 1815									
Elater ferrugineus ferrugineus Linnaeus, 1758		X				N			VU
Mulsanteus guillebeaui (Mulsant & Godart, 1853)	X	N				N		B	
Megapenthini Gurjeva, 1973									
Megapenthes lugens (W. Redtenbacher, 1842)	H	N		B	B			B	VU
Procraerus tibialis (Lacordaire, 1835)				B				!	EN
Melanotini Candèze, 1859									
Melanotus castanipes (Paykull, 1800)	X				CK	X	X	B	LC
Melanotus crassicollis (Erichson, 1841)	H	X		N		X	X	B	
Melanotus dichrous (Erichson, 1841)	X		X		B			CK	
Melanotus tenebrosus (Erichson, 1841)	H	X		B	CK	X	X	B	
Melanotus villosus (Geoffroy, 1785)	X		X		CK	X	X	B	LC
Pomachiliini Candèze, 1859									
Betarmon bisbimaculatus (Fabricius, 1803)		X		N	N	CK	X	B	
Idiotarmon quadrivittatus (Ragusa, 1893) [E]		X				X	X	B	
Idolus picipennis (Bach, 1852)				CK	CK	X	X		
Isidus moreli Mulsant & Rey, 1875		B							VU
Synaptini Gistel, 1856									
Adrastus axillaris Erichson, 1841		X			CK	CK	X		
Adrastus limbatus (Fabricius, 1777)	!				!		!		
Adrastus rachifer (Geoffroy, 1785)	X	X	X	N	CK	X	X	B	
Adrastus sekerae Reitter, 1910 [E]		X			CK			B	
Synaptus filiformis (Fabricius, 1781)	X	X	CK	N	CK	X		!	
Lissominae Laporte, 1835									
Lissomini Laporte, 1835									
Smetana in Cat. Pal. Col., vol. 4, 2007; Kundrata et al., 2018									
Drapetes mordelloides (Host, 1789)	X	X				X	X	N	LC
Negastriinae Nakane & Kishii, 1956									
Quasimusini Schimmel & Tarnawski, 2009									
Quasimus liliputanus (Germar, 1844)								B	
Quasimus minutissimus (Germar, 1823)	X	X	X	CK	CK	X	X	B	
Zorochros boubersi Leseigneur, 1970							X		
Zorochros curtus (Germar, 1844)		X				CK		B	

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Zorochros dermestoides (Herbst, 1806)	CK	CK			CK	B		B	
Zorochros meridionalis (Laporte, 1840)	X	X				!		B	
Zorochros pumilio (Kiesenwetter, 1858)					CK	CK	X	B	
Zorochros trigonochirus (Binaghi, 1933)		X			CK	CK		B	

DERODONTIFORMIA LeConte, 1861

DERODONTOIDEA LeConte, 1861

DERODONTIDAE LeConte, 1861

Derodontinae LeConte, 1861

Háva in Cat. Pal. Col., vol. 4, 2007

Derodontus raffrayi Grouvelle, 1917 [E]		B			B	B			VU

NOSODENDRIDAE Erichson, 1846

Steinhammer in Cat. Pal. Col., vol. 4, 2007

Nosodendron fasciculare (A.G. Olivier, 1790)					N				LC

BOSTRICHIFORMIA Forbes, 1926

BOSTRICHOIDEA Latreille, 1802

DERMESTIDAE Latreille, 1804

Dermestinae Latreille, 1804

Dermestini Latreille, 1804

Háva in Cat. Pal. Col., vol. 4, 2007

Dermestes erichsoni Ganglbauer, 1904				N	N				
Dermestes frischii Kugelann, 1792	H	X	X	N		X	X		
Dermestes fuliginosus P. Rossi, 1792	H						X		
Dermestes gyllenhalii gyllenhalii Laporte, 1840			N		N	N	N	N	
Dermestes laniarius Illiger, 1801	H	X				X			
Dermestes lardarius Linnaeus, 1758						N	X	B	
Dermestes mustelinus Erichson, 1846		N		N	N	N			
Dermestes olivieri Lepesme, 1939	X	X		N	N	X	X	N	
Dermestes undulatus Brahm, 1790	N	X	N		N	N			

Thorictinae Agassiz, 1846

Thorictini Agassiz, 1846

Löbl in Cat. Pal. Col., vol. 4, 2007

Thorictus grandicollis grandicollis Germar, 1842	X	X			N			N	
Thorictus stricticollis stricticollis Kraatz, 1859								!	

Orphilinae LeConte, 1861

Háva in Cat. Pal. Col., vol. 4, 2007

Orphilus niger (P. Rossi, 1790)	H	X		N		X	X	N	LC

Trinodinae Casey, 1900

Trinodini Casey, 1900

Trinodes hirtus (Fabricius, 1781)	H	X	X				X	N	LC

Attageninae Laporte, 1840

Attagenini Laporte, 1840

Háva in Cat. Pal. Col., vol. 4, 2007

Attagenus bifasciatus (A.G. Olivier, 1790)			N				N		
Attagenus brunneus Faldermann, 1835		X							
Attagenus calabricus Reitter, 1881 [E]	X	X		N		X	X	B	
Attagenus lobatus Rosenhauer, 1856	X								
Attagenus pilosissimus Roubal, 1932	H			N	B	X	X	N	
Attagenus silvaticus Zhantiev, 1976	B								
Attagenus unicolor unicolor (Brahm, 1790)	X	X		N		X	X		

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Paranovelsis punctatus (Scopoli, 1772)						X	X		
Megatominae Leach, 1815 **Anthrenini** Casey, 1900 Háva in Cat. Pal. Col., vol. 4, 2007									
Anthrenus angustefasciatus Ganglbauer, 1904						B			
Anthrenus coloratus Reitter, 1881	B								
Anthrenus delicatus Kiesenwetter, 1852	B								
Anthrenus fuscus A.G. Olivier, 1790						X	X		
Anthrenus munroi Hinton, 1943	X	X				X			
Anthrenus pimpinellae pimpinellae (Fabricius, 1775)	H	X		N					
Anthrenus scrophulariae scrophulariae (Linnaeus, 1758)		X					X	N	
Anthrenus signatus Erichson, 1846	H	N	B			X			
Anthrenus verbasci (Linnaeus, 1767)	H	X	X	N	N	X	X	N	
Megatomini Leach, 1815									
Ctesias serra (Fabricius, 1792)						X	X		LC
Globicornis corticalis (Eichhoff, 1863)			N		N	N			NT
Globicornis emarginata (Gyllenhal, 1808)	X	X				X	X		LC
Globicornis fasciata (Fairmaire & C.N.F. Brisout de Barneville, 1859)		N				B			LC
Globicornis nigripes (Fabricius, 1792)					N	N			LC
Globicornis picta (Küster, 1851)	H					X			LC
Globicornis sulcata (C.N.F. Brisout de Barneville, 1866)					B	X			NT
Globicornis tristis (Reitter, 1881)		X							LC
Globicornis variegata (Küster, 1851)			X	N	N	X	X	N	LC
Trogoderma glabrum (Herbst, 1783)						N			
Trogoderma granarium Everts, 1898	X								
Trogoderma inclusum LeConte, 1854		X							
BOSTRICHIDAE Latreille, 1802 **Bostrichinae** Latreille, 1802 **Apatini** Jacquelin du Val, 1861 Borowski in Cat. Pal. Col., vol. 4, 2007									
Apate monachus Fabricius, 1775		B			N			B	NT
Bostrichini Latreille, 1802									
Amphicerus bimaculatus (A.G. Olivier, 1790)	X	X						N	LC
Bostrichus capucinus (Linnaeus, 1758)	X	X		N	N	X	X	B	LC
Lichenophanes numida Lesne, 1899			N						EN
Lichenophanes varius (Illiger, 1801)	X	B			B			B	EN
Micrapate xyloperthoides (Jacquelin du Val, 1859	N								LC
Sinoxylonini Lesne, 1899									
Sinoxylon muricatum (Linnaeus, 1767)	X	X			N	X			LC
Sinoxylon perforans (Schrank, 1789)					N				LC
Xyloperthini Lesne, 1921									
Enneadesmus trispinosus (A.G. Olivier, 1795)								N	NT
Scobicia chevrieri (A. Villa & G.B. Villa, 1835)	X	X	X	N	N	X	X	N	LC
Xylopertha praeusta (Germar, 1817)								N	LC
Xylopertha retusa (A.G. Olivier, 1790)				N		N	X	N	VU
Xyloperthella picea picea (A.G. Olivier, 1790)		X			N				LC
Dinoderinae C.G. Thomson, 1863									
Rhyzopertha dominica (Fabricius, 1792)	X	X	X	N		X	X	N	
Stephanopachys quadricollis (Marseul, 1878)						X	X	N	VU

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Lyctinae Billberg, 1820									
Lyctini Billberg, 1820									
Lyctus brunneus (Stephens, 1830)		N							LC
Trogoxylini Lesne, 1921									
Trogoxylon impressum (Comolli, 1837)	X	X	X		N	X	X	N	LC
Psoinae Blanchard, 1851									
Psoini Blanchard, 1851									
Psoa dubia (P. Rossi, 1792)	H	X	N					N	LC
PTINIDAE Latreille, 1802									
Anobiinae Fleming, 1821									
Anobiini Fleming, 1821									
Zahradnik in Cat. Pal. Col. Vol. 4, 2007; Zahradnik, 2013									
Anobium hederae Ihssen, 1949	N	N				N			LC
Anobium punctatum (DeGeer, 1774)	X	X		N		X	X	N	LC
Cacotemnus thomsoni (Kraatz, 1881)		N							EN
Hemicoelus canaliculars (C.G. Thomson, 1863)								N	LC
Hemicoelus costatus (Aragona, 1830)	H			N	N	B	N	N	LC
Hemicoelus fulvicornis (Sturm, 1837)		N		N		N	N	N	LC
Microbregma emarginatum (Duftschmid, 1825)	H				N				LC
Gastrallini White, 1982									
Falsogastrallus unistriatus (Zoufal, 1897)		N							EN
Gastrallus corsicus Schilsky, 1898		N				N			LC
Gastrallus immarginatus (P.W.J. Müller, 1821)	N	X				N			LC
Gastrallus laevigatus (A.G. Olivier, 1790)	H	N			N	N			LC
Hadrobregmini White, 1982									
Hadrobregmus denticollis (Creutzer, 1796)							N		LC
Hadrobregmus pertinax (Linnaeus, 1758)						N			LC
Nicobiini White, 1982									
Nicobium castaneum (A.G. Olivier, 1790)		X						N	LC
Stegobiini White, 1982									
Oligomerus brunneus (A.G. Olivier, 1790)	X			N					LC
Oligomerus ptilinoides (Wollaston, 1854)	X	X			N	X	X	N	LC
Stegobium paniceum (Linnaeus, 1758)	H	X	X	N	N	X	N	N	
Dorcatominae C.G. Thomson, 1859									
Dorcatomini C.G. Thomson, 1859									
Caenocara affine (Sturm, 1837)		X						N	LC
Caenocara subglobosum (Mulsant & Rey, 1864)	X	X		N		X			LC
Dorcatoma chrysomelina Sturm, 1837	N							N	LC
Dorcatoma dresdensis Herbst, 1792				B	N				LC
Dorcatoma flavicornis (Fabricius, 1792)	N								LC
Dorcatoma setosella setosella Mulsant & Rey, 1864								B	LC
Mizodorcatoma dommeri (Rosenhauer, 1856)		N				N		N	LC
Prothecini White, 1982									
Stagetus andalusiacus cribricollis (Aubé, 1861)								B	LC
Stagetus byrrhoides (Mulsant & Rey, 1861)					N			N	LC
Stagetus calabriensis Toskina, 2012 [E]								B	LC
Stagetus elongatus (Mulsant & Rey, 1861)								N	LC
Stagetus italicus (Reitter, 1885)				N		N		N	LC
Stagetus pilula (Aubé, 1861)	X	N	X					N	LC
Dryophilinae LeConte, 1861									
Dryophilini LeConte, 1861									

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Dryophilus densipilis Abeille de Perrin, 1872		N					N	N	LC
Dryophilus longicollis (Mulsant & Rey, 1853)								N	LC
Dryophilus pusillus (Gyllenhal, 1808)		N		N		B	N	N	LC
Grynobius planus (Fabricius, 1787)						N			LC
Homophthalmus rugicollis (Mulsant & Rey, 1853)	H	X			N	X	X	N	LC
Ernobiinae Pic, 1912 **Ernobiini** Pic, 1912									
Episernus gentilis (Rosenhauer, 1847)					N				LC
Episernus granulatus J. Weise, 1887								N	VU
Episernus striatellus (C.N.F. Brisout de Barneville, 1863)					N				VU
Ernobius abietinus (Gyllenhal, 1808)	B								LC
Ernobius angelinii Lohse, 1991 [E]						B			EN
Ernobius longicornis (Sturm, 1837)						X		N	LC
Ernobius mollis mollis (Linnaeus, 1758)					N	N			LC
Ernobius nigrinus (Sturm, 1837)						X	X	N	LC
Ochinini Zahradník, 2013									
Ochina hirsuta Seidlitz, 1889		X							LC
Ochina latreillii (Bonelli, 1812)						X		N	NT
Ochina ptinoides (Marsham, 1802)	X	X			N	N	X		LC
Xestobiini White, 1982									
Hyperisus plumbeum (Illiger, 1801)	H	X						N	LC
Xestobium rufovillosum (DeGeer, 1774)					N	X	X	N	LC
Xestobium subincanum Reitter, 1878						B			EN
Eucradinae LeConte, 1861 **Hedobiini** Mulsant & Rey, 1868									
Hedobia pubescens (A.G. Olivier, 1790)				B	N	N	X	N	LC
Ptinomorphus angustatus (C.N.F. Brisout de Barneville, 1862						N			VU
Ptinomorphus imperialis (Linnaeus, 1767)	H	X		N	N	X	X	N	LC
Ptinomorphus regalis (Duftschmid, 1825)		X		N		X			LC
Gibbiinae Mulsant & Rey, 1868 **Gibbiini** Mulsant & Rey, 1868 Borowski in Cat. Pal. Col., vol. 4, 2007; Zahradník, 2013									
Gibbium psylloides (Czenpinski, 1778)	H								
Mesocoelopodinae Mulsant & Rey, 1864 **Mesocoelopodini** Mulsant & Rey, 1864 Zahradník in Cat. Pal. Col., vol. 4, 2007; Zahradník, 2013									
Mesocoelopus collaris Mulsant & Rey, 1864	H	X							LC
Mesocoelopus creticus Fairmaire, 1880		N							
Mesocoelopus niger (P.W.J. Müller, 1821)	N	N				N	N		LC
Mesothes ferrugineus (Mulsant & Rey, 1861)	X					N			LC
Ptilininae Shuckard, 1840 **Ptilinini** Shuckard, 1840									
Ptilinus fuscus (Geoffroy, 1785)	N				N				LC
Ptilinus pectinicornis (Linnaeus, 1758)						X	X		LC
Ptininae Latreille, 1802 **Ptinini** Latreille, 1802 Borowski in Cat. Pal. Col., vol. 4, 2007; Zahradník, 2013									
Bruchoptinus femoralis Reitter, 1884	H	X			N		N		
Bruchoptinus rufipes (A.G. Olivier, 1790)		N							
Dignomus carinatus (P.H. Lucas, 1846)	X	X						N	
Dignomus jacqueti (Pic, 1895)								N	

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Niptus hololeucus (Faldermann, 1835)						N			
Pseudeurostus apenninus (Baudi di Selve, 1874) [E]				N	N	N		N	
Pseudoptinus lichenum (Marsham, 1802)	X	X		N	N	N		N	LC
Ptinus atricapillus Kiesenwetter, 1877	H				N			N	
Ptinus aubei Boieldieu, 1854	H	X			N	X	X		
Ptinus bidens A.G. Olivier, 1790	H	X		N	N	N		N	
Ptinus calcaratus Kiesenwetter, 1877	H		X	N	N	X	X	N	
Ptinus corsicus Kiesenwetter, 1877	N			N	N	N	N	N	
Ptinus dubius Sturm, 1837		X							
Ptinus fur (Linnaeus, 1758)	X	X				X	X	N	
Ptinus latro Fabricius, 1775	X	X		N		X	X	N	
Ptinus obesus P.H. Lucas, 1846	X	X		N	N	X	X	N	
Ptinus perrini (Reitter, 1884)		N			N				
Ptinus pilosus P.W.J. Müller, 1821	H				N	X	X	N	
Ptinus raptor Sturm, 1837	H								
Ptinus reitteri Pic, 1894								N	
Ptinus sexpunctatus Panzer, 1789		X					N		
Ptinus spitzyi A. Villa & G.B. Villa, 1838		N							
Ptinus subpilosus Sturm, 1837	H	N			N	N			
Ptinus tarsalis (Reitter, 1884)	X	X				X		N	
Ptinus variegatus P. Rossi, 1792	X								

Xyletininae Gistel, 1856

Lasiodermini White, 1982

Zahradnik in Cat. Pal. Col., vol. 4, 2007; Zahradnik, 2013

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Lasioderma baudii Schilsky, 1899	X	X		N		X	X	N	
Lasioderma bubalus bubalus Fairmaire, 1860	H		N	N	N	X	X		
Lasioderma haemorrhoidale (Illiger, 1807)	H		X	N				N	
Lasioderma kiesenwetteri Schilsky, 1899	H	N		N	N				
Lasioderma laeve (Illiger, 1807)		N	N					N	
Lasioderma obscurum (Solsky, 1868)	X	X	X	N	N	X	X	N	
Lasioderma redtenbacheri redtenbacheri (Bach, 1852)	X	X	X		N	N		N	
Lasioderma serricorne (Fabricius, 1792)		X		N		X			

Xyletinini Gistel, 1856

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Xyletinus ater (Creutzer, 1796)						N	N		LC
Xyletinus balcanicus Gottwald, 1977					N				VU
Xyletinus fibyensis Lundblad, 1949		N							VU
Xyletinus laticollis (Duftschmid, 1825)	X	X	N	N	N	X	X	N	LC
Xyletinus longitarsis longitarsis Jansson, 1942			N			B		N	VU
Xyletinus pectinatus pectinatus (Fabricius, 1792)				N					LC
Xyletinus pectiniferus Fairmaire, 1879		X							NT
Xyletinus subrotondatus Lareynie, 1852		N				X			
Xyletinus vaederoeensis Lundberg, 1969		N							

Xyletinini genera incertae sedis

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Metholeus phoenicis (Fairmaire, 1859)	X	X				N			

CUCUJIFORMIA Lameere, 1938
LYMEXYLOIDEA Fleming, 1821

LYMEXYLIDAE Fleming, 1821

Hylecoetinae Gistel, 1856

Cuccodoro in Cat. Pal. Col., vol. 4, 2007

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Elateroides dermestoides (Linnaeus, 1761)					N	X	X	N	NT

Lymexylinae Fleming, 1821

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Lymexylon navale (Linnaeus, 1758)	X							N	NT
CLEROIDEA Latreille, 1802 sensu Robertson et al., 2015; Gimmel et al., 2019									
BYTURIDAE Jacquelin du Val, 1858 Löbl in Cat. Pal. Col., vol. 4, 2007; Robertson et al., 2015									
Byturus ochraceus (L.G. Scriba, 1790)						N			
Byturus tomentosus (DeGeer, 1774)	X					X	X		
BIPHYLLIDAE LeConte, 1861 Jelínek in Cat. Pal. Col., vol. 4, 2007; Robertson et al., 2015									
*Biphyllus fra*ter (Aubé, 1850)		N			N	N	X	N	LC
Biphyllus lunatus (Fabricius, 1787)	X	X				N			LC
Diplocoelus fagi (Chevrolat, 1837)	H	X		N	N	X	X	N	LC
PELTIDAE Kirby, 1837 **Peltini** Kirby, 1837 Kolibáč in Cat. Pal. Col., vol. 4, 2007; Gimmel et al., 2019									
Peltis ferruginea (Linnaeus, 1758)						X	X	N	NT
Peltis grossa (Linnaeus, 1758)						X	B	B	NT
LOPHOCATERIDAE Crowson, 1964 Kolibáč in Cat. Pal. Col., vol. 4, 2007; Gimmel et al., 2019									
Grynocharis oblonga (Linnaeus, 1758)						B		B	NT
TROGOSSITIDAE Latreille, 1802 **Trogossitinae** Latreille, 1802 **Trogossitini** Latreille, 1802 Kolibáč in Cat. Pal. Col., vol. 4, 2007; Gimmel et al., 2019;									
Nemozoma elongatum (Linnaeus, 1761)	N				N	X		N	LC
Temnoscheila caerulea (A.G. Olivier, 1790)	X	X		N	N	X	X	N	LC
Tenebroides mauritanicus (Linnaeus, 1758)	X	X		N			B	B	LC
THYMALIDAE Léveillé, 1888 **Thymalinae** Léveillé, 1888 Kolibáč in Cat. Pal. Col., vol. 4, 2007; Gimmel et al., 2019									
Thymalus limbatus (Fabricius, 1787)						X	X	N	LC
RHADALIDAE LeConte, 1862 **Rhadalinae** LeConte, 1862 **Aplocnemini** Majer, 1987 Mayor in Cat. Pal. Col., vol. 4, 2007; Bocakova et al., 2011; Gimmel et al., 2019									
Aplocnemus angelinii Liberti, 1994		B							LC
Aplocnemus chalconatus (Germar, 1817)	X	B				B			
Aplocnemus corcyricus (L. Miller, 1866)		B			B			B	LC
Aplocnemus etruscus Liberti & Zinetti, 2009					B				NT
Aplocnemus integer (Baudi di Selve, 1873)					B		X?	B	LC
Aplocnemus jejunus (Kiesenwetter, 1863)					!			B	LC
Aplocnemus marginatus (Rottenberg, 1871)								B	LC
Aplocnemus nigricornis garganicus Liberti, 1994 [E]	B								NT
Aplocnemus nigricornis nigricornis (Fabricius, 1792)				B	B	X	X	B	LC
Trichoceble floralis floralis (A.G. Olivier, 1790)					B				
Trichoceble memnonia (Kiesenwetter, 1861)						B	B	B	

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
MELYRIDAE Leach, 1815									
Malachiinae Fleming, 1821									
Malachiini Fleming, 1821									
Apalochrina Mulsant & Rey, 1867									
Mayor in Cat. Pal. Col., vol. 4, 2007; Gimmel et al., 2019									
Protapalochrus flavolimbatus Mulsant & Rey, 1853	X								
Attalina Abeille de Perrin, 1890									
Attalus amictus (Erichson, 1840)	B?				B?	X?			
Attalus analis (Panzer, 1798)					N	X	X		LC
Attalus cyaneus (Fabricius, 1787)	X	B						B	
Attalus minimus (P. Rossi, 1790)				N		N		N	
Attalus nourricheli nourricheli (Laporte, 1838)	X	X	X	N	B	X	X	B	
Attalus sericans (Erichson, 1840)		B			B	N			
Attalus varitarsis (Kraatz, 1862)		B				B			
Sphinginus coarctatus (Erichson, 1840)	X	X		B	B			B	LC
Sphinginus lobatus lobatus (A.G. Olivier, 1790)	H					X		B	LC
Colotina Abeille de Perrin, 1890									
Colotes maculatus (Laporte, 1838)	X	X	X	N	B	X	X	B	
Colotes punctatus (Erichson, 1840)		B							
Ebaeina Portevin, 1931									
Ebaeus ater Kiesenwetter, 1863						X			
Ebaeus battonii Pardo Alcaide, 1962					B				LC
Ebaeus gibbus (Drapiez, 1819)			X		N	B	B	B	LC
Hypebaeus flavicollis (Erichson, 1840)	X			N	N	N		B	LC
Hypebaeus flavipes (Fabricius, 1787)						X			LC
Malachiina Fleming, 1821									
Anthocomus fasciatus (Linnaeus, 1758)	H	X				N			
Anthocomus rufus rufus (Herbst, 1784)	X	X	B			X	X		
Anthomalachius spinosus (Erichson, 1840)		X	B	B			B		
Axinotarsus insularis Abeille de Perrin, 1881		X			B			N	
Axinotarsus italicus Escalera, 1926 [E]					B	X		B	
Axinotarsus longicornis (Kiesenwetter, 1859)				B?					
Axinotarsus marginalis (Laporte, 1840)		X							
Axinotarsus pulicarius (Fabricius, 1777)					N	B	X	B	
Axinotarsus ruficollis (A.G. Olivier, 1790)	X	B		B	B	X	X	B	
Charopus apicalis Kiesenwetter, 1859	H	X		N	B	N		B	
Charopus concolor (Fabricius, 1801)	H					B	B	N	
Charopus docilis Kiesenwetter, 1852						B	B	B	
Charopus pallipes (A.G. Olivier, 1790)	H	B		B	B	X	X	B	
Charopus philoctetes Abeille de Perrin, 1885							B		
Charopus rotundatus Erichson, 1840	X?						X?		
Clanoptilus affinis subconcolor Pic, 1911					B				
Clanoptilus bellieri (Peyron, 1877)		B				B			
Clanoptilus calabrus (Baudi di Selve, 1873) [E]							X	B	LC
Clanoptilus emarginatus (Krauss, 1902)	H		X	B	B	X	X	B	
Clanoptilus geniculatus (Germar, 1824)	H	X	X	B	B	N	B		
Clanoptilus italicus (Pardo Alcaide, 1967) [E]	H		X	B	B	X	X		LC
Clanoptilus spinipennis brevispina (Kiesenwetter, 1871)	H	X	B	B	N	X	X	B	
Cordylepherus viridis (Fabricius, 1787)	X		B	B	B	X	X	B	
Cyrtosus cyanipennis (Erichson, 1840)								B	
Cyrtosus ovalis (Laporte, 1838)	H			B	B	X	X	B	
Malachius aeneus (Linnaeus, 1758)	H	B	X	N	B	X	X	N	

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Malachius australis Mulsant & Rey, 1867	H	N	X	B	B	X	X	B	
Malachius bipustulatus (Linnaeus, 1758)				B	B	X		B	
Troglopina Mulsant & Rey, 1867									
Troglops albicans (Linnaeus, 1767)					B			B	LC
Troglops italicus Wittmer, 1984								B	
Dasytinae Laporte, 1840									
Danaceini Kiesenwetter, 1863									
Danacea ambigua Mulsant & Rey, 1868	X	X		N	N	X	X		
Danacea apula Liberti, 2007 [E]	B								
Danacea aurichalcea (Küster, 1850)	H	X	X	N	N	X	X	N	
Danacea concii Liberti, 1984 [E]			X		B	X			
Danacea cusanensis (A. Costa, 1847) [E]	X	X	X		B	X	X	B	
Danacea jonica Liberti, 1985 [E]								B	
Danacea lucana Liberti, 1989 [E]						B	X		
Danacea marginata (Küster, 1851)								B	
Danacea nigritarsis brunneipes Pic, 1927 [E]	B			N		X	X		
Danacea scyllea Liberti, 1981 [E]						N	X	B	
Dasytini Laporte, 1840									
Dasytes aeneiventris Küster, 1850	H	X	X	B	B	X	X	B	LC
Dasytes aeratus Stephens, 1830	B		X	N	B	X	X	B	LC
Dasytes caeruleus (DeGeer, 1774)				B	B	X		B	LC
Dasytes flavescens Gené, 1839		X				B		B	
Dasytes nigroaeneus Küster, 1850								B	LC
Dasytes pauperculus Laporte, 1840	B								LC
Dasytes plumbeus (O.F. Müller, 1776)	H	X	B	B	B	X	X	B	LC
Dasytes productus Schilsky, 1894								B	
Dasytes striatulus Brullé, 1832	H	X	X		B	B			
Dasytes subaeneus Schönherr, 1817	B					B			
Dasytes tardus L.W. Schaufuss, 1876					B		X		
Dasytes thoracicus lucanus Wittmer, 1935						X			VU
Dasytes tristiculus Mulsant & Rey, 1868	H	B				B	B	B	
Divales bipustulatus (Fabricius, 1781)	X			B	N	X	X	N	
Divales cinctus (Gené, 1839)		X			N	X		N	
Dolichosoma simile (Brullé, 1832)	H	X							
Enicopus ater (Fabricius, 1787)	!								
Enicopus pilosus (Scopoli, 1763)	X	X	X	B	B	X	X	B	
Psilothrix melanostoma (Brullé, 1832)	H		X	N	N	X	X	N	
Psilothrix viridicoerulea (Geoffroy, 1785)	H	X	X	N	N	X	X	N	
CLERIDAE Latreille, 1802									
Tillinae Leach, 1815									
Löbl, Rolčík, Kolibáč & Gerstmeier in Cat. Pal. Col., vol. 4, 2007; Gimmel et al., 2919									
Denops albofasciatus (Charpentier, 1825)	X	X			!	N			NT
Tilloidea transversalis (Charpentier, 1825)	X	X	X	N	!	X	X	B	
Tilloidea unifasciata (Fabricius, 1787)					N			N	NT
Tillus elongatus (Linnaeus, 1758)						X	X?		NT
Korynetinae Laporte, 1836									
Enoplium doderoi Luigioni, 1926		X							EN
Enoplium serraticorne (A.G. Olivier, 1790)						B		B	NT
Korynetes pusillus (Klug, 1842)	!	X	X		N	N	X	!	NT
Necrobia ruficollis (Fabricius, 1775)	H								
Necrobia rufipes (DeGeer, 1775)	X	X			!	X		N	
Necrobia violacea (Linnaeus, 1758)	!	X	N	N	!	N	X	!	

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Tarsostenus univittatus (P. Rossi, 1792)	!				!				
Clerinae Latreille, 1802									
Clerus mutillarius mutillarius Fabricius, 1775	X	X	X	N	N	X	X	N	NT
Opilio domesticus (Sturm, 1837)	!	X			!	!			LC
Opilio mollis (Linnaeus, 1758)	X	X			!	X	X	N	LC
Opilio pallidus (A.G. Olivier, 1795)								B	NT
Opilio taeniatus (Klug, 1842)				N		X			VU
Thanasimus formicarius formicarius (Linnaeus, 1758)	X	X		N	N	X	X	N	LC
Trichodes alvearius (Fabricius, 1792)	H	X	X	N	N	X	X	N	
Trichodes apiarius (Linnaeus, 1758)					!	X	X	B	
Trichodes leucopsideus (A.G. Olivier, 1795)	X	X	X	!	N	X	X	N	
CUCUJOIDEA Latreille, 1802 sensu Robertson et al., 2015									
SPHINDIDAE Jacquelin du Val, 1860 **Sphindinae** Jacquelin du Val, 1860 Jelinek in Cat. Pal. Col., vol. 4, 2007									
Sphindus dubius (Gyllenhal, 1808)	H	X				X		N	NT
Aspidiphorinae Kiesenwetter, 1877									
Aspidiphorus lareyniei Jacquelin du Val, 1859		X							NT
Aspidiphorus orbiculatus (Gyllenhal, 1808)	X	X		N	N	X	X	N	LC
EROTYLIDAE Latreille, 1802 **Cryptophilinae** Casey, 1900 **Cryptophilini** Casey, 1900 Wegrzynowic in Cat. Pal. Col., vol. 4, 2007									
Cryptophilus angustus (Rosenhauer, 1856)	X	N		N	N	N	X	N	LC
Xenoscelinae Ganglbauer, 1899 **Xenoscelini** Ganglbauer, 1899									
Leucohimatium arundinaceum (Forskål, 1775)	H	X			N	N			
Setariola sericea (Mulsant & Rey, 1863)	X	X						N	LC
Xenoscelis costipennis (Fairmaire, 1852)						N			LC
Erotylinae Latreille, 1802 **Dacnini** Crotch, 1876									
Dacne bipustulata (Thunberg, 1781)	X								LC
Dacne pontica (Bedel, 1868)				N		X	X		NT
Dacne rufifrons (Fabricius, 1775)						X	X		NT
Tritomini Curtis, 1834									
Triplax aenea (Schaller, 1783)						X	B	B	LC
Triplax collaris (Schaller, 1783)		N			N				DD
Triplax lacordairii Crotch, 1870	H	X		N	N	X	X	N	NT
Triplax lepida (Faldermann, 1837)	H								NT
Triplax marseuli Bedel, 1868		X				X	X	N	NT
Triplax russica (Linnaeus, 1758)	X	X		N		X	X	N	LC
Triplax scutellaris Charpentier, 1825						N			LC
Tritoma bipustulata Fabricius, 1775	H	X		N	N	X			LC
MONOTOMIDAE Laporte, 1840 **Rhizophaginae** L. Redtenbacher, 1845 Jelínek in Cat. Pal. Col., vol. 4, 2007; Otero, 2011									
Rhizophagus bipustulatus (Fabricius, 1792)	H	X	N	N	N	X	X	N	LC
Rhizophagus depressus (Fabricius, 1792)	X								DD
Rhizophagus dispar (Paykull, 1800)	X	X		N	N	X	X	N	LC

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Rhizophagus ferrugineus (Paykull, 1800)							X		LC
Rhizophagus nitidulus (Fabricius, 1798)	X					X			NT
Rhizophagus unicolor P.H. Lucas, 1849	H								LC
Monotominae Laporte, 1840									
Monotoma bicolor A. Villa & G.B. Villa, 1835		N			N	N	N		LC
Monotoma brevicollis brevicollis Aubé, 1838	X	N	X	N	N	N		N	LC
Monotoma diecki Reitter, 1877		N							LC
Monotoma johnsoni Bousquet & Laplante, 1999			N		N				LC
Monotoma longicollis (Gyllenhal, 1827)	X	X	X			X			LC
Monotoma picipes Herbst, 1793		X	X	N				N	LC
Monotoma spinicollis Aubé, 1837	X	X		N				N	LC
KATERETIDAE Erichson, 1846 Jelínek in Cat. Pal. Col., vol. 4, 2007									
Brachypterolus antirrhini (Murray, 1864)	H						X		
Brachypterolus linariae (Stephens, 1830)	B			N	N	X		B	
Brachypterolus pulicarius (Linnaeus, 1758)	H								
Brachypterus curtulus Wollaston, 1864		B							
Brachypterus glaber (Newman, 1834)	H	X					X	N	
Brachypterus urticae (Fabricius, 1792)	X			N		X	X	N	
Kateretes dalmatinus (Sturm, 1844)		X			B				
Kateretes pusillus (Thunberg, 1794)						N	N		
Kateretes rufilabris (Latreille, 1807)	X	X				N	X		
NITIDULIDAE Latreille, 1802 **Epuraeinae** Kirejtshuk, 1986 Jelínek & Audisio in Cat. Pal. Col., vol. 4, 2007; Cline et al., 2014									
Epuraea unicolor (A.G. Olivier, 1790)	H	X	X	N	N	X	X	N	LC
Epuraea thoracica Tournier, 1872						B			VU
Epuraea terminalis (Mannerheim, 1843)						CK			LC
Epuraea silacea (Herbst, 1783)					CK	X			VU
Epuraea rufomarginata (Stephens, 1830)						B			VU
Epuraea pallescens (Stephens, 1832)	H			N		X	X		LC
Epuraea ocularis Fairmaire, 1849								B	
Epuraea melina Erichson, 1843	CK				CK	X	X	CK	
Epuraea melanocephala (Marsham, 1802)	H		CK		CK	CK	B		LC
Epuraea marseuli Reitter, 1873							X	B	LC
Epuraea luteola Erichson, 1843				N	N	N		B	
Epuraea longula Erichson, 1845			X			X		CK	LC
Epuraea imperialis (Reitter, 1877)								B	
Epuraea guttata (A.G. Olivier, 1811)		X			CK	X	B		LC
Epuraea fuscicollis (Stephens, 1835)		N	X	N	CK	X	X	CK	LC
*Epuraea fageti*cola Audisio, 1991	X	X			B	B	B		VU
Epuraea biguttata (Thunberg, 1784)						B			LC
Epuraea angustula Sturm, 1844		X			N	B			VU
Epuraea aestiva (Linnaeus, 1758)	X			N	CK	X	X	CK	
Carpophilinae Erichson, 1842									
Carpophilus bifenestratus Murray, 1864		X		N	N	N		N	
Carpophilus bipustulatus (Heer, 1841)		X	CK			B	B		LC
Carpophilus hemipterus (Linnaeus, 1758)	X	X	X	N	N	CK			
Carpophilus marginellus Motschulsky, 1858		CK	X			CK		N	
Carpophilus mutilatus Erichson, 1843	X	X		N	N	CK		N	
Carpophilus nepos Murray, 1864	X	X	X		N	CK		B	
Carpophilus obsoletus Erichson, 1843	B	X				CK			

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Carpophilus quadrisignatus Erichson, 1843		X				CK			
Carpophilus sexpustulatus (Fabricius, 1792)	H	N							NT
Urophorus humeralis (Fabricius, 1798)		N		N	N	CK		B	
Urophorus rubripennis (Heer, 1841)	H	N			CK	N			
Cryptarchinae C.G. Thomson, 1859									
Cryptarcha strigata (Fabricius, 1787)	X	X			CK	X	X		LC
Cryptarcha undata (A.G. Olivier, 1790)					CK	X			NT
Glischrochilus quadriguttatus (Fabricius, 1777)	H								VU
Glischrochilus quadripunctatus (Linnaeus, 1758)						B	X		NT
Pityophagus ferrugineus (Linnaeus, 1761)						B	X		LC
Nitidulinae Latreille, 1802									
Aethina tumida Murray, 1867								B	
Amphotis marginata (Fabricius, 1781)	X				B	CK	X		LC
Cychramus luteus (Fabricius, 1787)		CK				CK			LC
Ipidia binotata Reitter, 1875						X	B	B	VU
Nitidula carnaria (Schaller, 1783)	X	X	X	N		X	X		
Nitidula flavomaculata P. Rossi, 1790	X	X				CK			
Nitidula rufipes (Linnaeus, 1767)	CK	X	CK	CK		CK	CK	N	
Omosita colon (Linnaeus, 1758)							B	B	
Omosita discoidea (Fabricius, 1775)	CK	X	CK		CK	CK	CK	CK	
Pocadius ferrugineus (Fabricius, 1775)	X			N	N	X	X		
Soronia grisea (Linnaeus, 1758)		X	X		N		X	N	LC
Soronia oblonga C.N.F. Brisout de Barneville, 1863	X	X		CK	CK	X	X	CK	LC
Stelidota geminata (Say, 1825)								B	
Thalycra fervida (A.G. Olivier, 1790)					CK	CK	X	CK	
Xenostrongylus arcuatus Kiesenwetter, 1859	X	X	X			CK	X	CK	
Xenostrongylus lateralis Chevrolat, 1861								B	
Cillaeinae Kirejtshuk & Audisio, 1986									
Colopterus abdominalis (Erichson, 1843)								B	
Meligethinae C.G. Thomson, 1859 Audisio et al., 2009 for ex genus Meligethes									
Acanthogethes brevis (Sturm, 1845)	H					X	X	B	
Acanthogethes fuscus (A.G. Olivier, 1790)							X	B	
Acanthogethes reyi (Guillebeau, 1885)						X			
Acanthogethes solidus (Kugelann, 1794)						X			
Afrogethes buduensis (Ganglbauer, 1899)	CK							B	
Afrogethes planiusculus (Heer, 1841)	H	X	CK	CK	CK	X	X	CK	
Astylogethes substrigosus (Erichson, 1845)	H	X	X			X	X	B	
Brassicogethes aeneus (Fabricius, 1775)	H	X	X	CK	CK	X	X	B	
Brassicogethes anthracinus (C.N.F. Brisout de Barneville, 1863)	H		X	CK	CK	X	CK	CK	
Brassicogethes arankae (Audisio & De Biase, 2005)						CK		B	
Brassicogethes coracinus (Sturm, 1845)						N	X	B	
Brassicogethes erysimicola (Audisio & De Biase, 2001)					CK	CK	CK	CK	
Brassicogethes lunariae (Audisio & De Biase, 1999)					CK	!		B	
Brassicogethes matronalis (Audisio & Spornraft, 1990)					CK				
Brassicogethes spornrafti (Audisio, 1977)				B		B			
Brassicogethes viridescens (Fabricius, 1787)	H	X	X	CK	N	X	X	B	
Clypeogethes lepidii (L. Miller, 1851)	X	X	X	B		X			
Clypeogethes tener (Reitter, 1873)	X								
Fabogethes brachialis Erichson, 1845					B	B			
Fabogethes nigrescens (Stephens, 1830)	H	X	CK	CK		X	X	B	
Genistogethes bidentatus (C.N.F. Brisout de Barneville, 1863)					N			CK	

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Genistogethes carinulatus (Forster, 1849)	H	X	X	N	N	CK	X	CK	
Genistogethes erichsoni (C.N.F. Brisout de Barneville, 1863)	H					X	X	CK	
Genistogethes immundus (Kraatz, 1858)							CK	B	
Genistogethes punctatus (C.N.F. Brisout de Barneville, 1863)	X	X	X	N	CK	X	X	B	
Lamiogethes angustatus (Küster, 1848)	X				CK	X		CK	
Lamiogethes bidens (C.N.F. Brisout de Barneville, 1863)	H					CK	X	CK	
Lamiogethes brunnicornis (Sturm, 1845)	H	B				CK	B		
Lamiogethes bucciarellii (Audisio, 1976)	X				B	B			
Lamiogethes difficilis (Heer, 1841)	X					CK	X	B	
Lamiogethes jelineki (Audisio, 1976)					B	B	B		
Lamiogethes kunzei (Erichson, 1845)						B		B	
Lamiogethes morosus (Erichson, 1845)	H					CK		B	
Lamiogethes paschalis (Spornraft, 1975) [E]					B	X		B	
Lamiogethes pedicularius (Gyllenhal, 1808)						B			
Lamiogethes persicus (Faldermann, 1835)						B			
Meligethes atratus (A.G. Olivier, 1790)	CK	X		N	CK	X	X	CK	
Meligethes denticulatus (Heer, 1841)							B		
Meligethes flavimanus Stephens, 1830			X	N	CK	X	X		
Pria dulcamarae (Scopoli, 1763)	H		CK	CK			CK	CK	
Sagittogethes distinctus Sturm, 1845						B		B	
Sagittogethes hoffmanni (Reitter, 1871)		CK	X					B	
Sagittogethes lindbergi (Rebmann, 1940)	B				B			B	
Sagittogethes maurus (Sturm, 1845)	CK								
Sagittogethes minutus (C.N.F. Brisout de Barneville, 1863)								B	
Sagittogethes obscurus (Erichson, 1845)						B		B	
Sagittogethes ovatus (Sturm, 1845)				B					
Sagittogethes umbrosus (Sturm, 1845)	H	X	X	N	CK	X	X	B	
Stachygethes nanus (Erichson, 1845)	X	X				CK		B	
Stachygethes ruficornis (Marsham, 1802)	H	X	CK			CK		B	
Stachygethes scholzi (Easton, 1960)	CK					B		B	
Stachygethes villosus (C.N.F. Brisout de Barneville, 1863)	H	X				CK		CK	
Thymogethes acicularis (C.N.F. Brisout de Barneville, 1863)	CK					CK	X	B	
Thymogethes egenus (Erichson, 1845)		N	X	B	N		CK	B	
Thymogethes exilis Sturm, 1845	H					CK			
Thymogethes fumatus (Erichson, 1845)	H	X				CK			
Thymogethes funereus (Jelinek, 1967)	X		X			CK		CK	
Thymogethes gagathinus (Erichson, 1845)		CK	X	CK		CK		B	
Thymogethes lugubris (Sturm, 1845)							B		
Thymogethes submetallicus (Sainte-Claire Deville, 1908)	H	X	X		B	B		B	
Xerogethes rotundicollis (C.N.F. Brisout de Barneville, 1863)	H	X	X	N		CK	CK	CK	
CRYPTOPHAGIDAE Kirby, 1837									
Cryptophaginae Kirby, 1837									
Caenoscelini Casey, 1900									
Johnson, Otero & Leschen in Cat. Pal. Col., vol. 4, 2007; Otero, 2011, 2013									
Caenoscelis angelinii C. Johnson & S. Bowestead, 2003 [E]						B		B	CR
Caenoscelis ferruginea (C.R. Sahlberg, 1820)								N	
Sternodea baudii Reitter, 1875		CK		CK	CK	X	X	B	LC
Cryptophagini Kirby, 1837									
Anterophagus pallens (Linnaeus, 1758)					CK	X	X	N	
Anterophagus silaceus (Herbst, 1792)						N		CK	
Cryptophagus badius Sturm, 1845	H					X			LC
Cryptophagus cylindrellus C. Johnson, 2007	H							B	DD

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Cryptophagus dentatus (Herbst, 1793)	H	X		N		X		B	LC
Cryptophagus denticulatus Heer, 1841	H	X	X	N	B	X	X	CK	LC
Cryptophagus distinguendus Sturm, 1845	N				N			N	
Cryptophagus dorsalis C.R. Sahlberg, 1819								N	DD
Cryptophagus falcozi Roubal, 1927					CK	CK			DD
Cryptophagus fasciatus Kraatz, 1852	N	X						CK	LC
Cryptophagus jakowlewi Reitter, 1888		X							LC
Cryptophagus labilis Erichson, 1846						CK	N		VU
Cryptophagus laticollis P.H. Lucas, 1846	H	X			N	N	CK	N	LC
Cryptophagus lycoperdi (Scopoli, 1763)	X	CK		CK	N			CK	
Cryptophagus micaceus Rey, 1889			N		N				
Cryptophagus pallidus Sturm, 1845	X	X	X	B	CK	X	X	B	LC
Cryptophagus parallelus C.N.F. Brisout de Barneville, 1863					N				DD
Cryptophagus populi Paykull, 1800	CK	CK							DD
Cryptophagus pubescens Sturm, 1845	H				B			CK	
Cryptophagus puncticollis P.H. Lucas, 1846	X	X			B	CK			DD
Cryptophagus ruficornis Stephens, 1830	H				N				LC
Cryptophagus saginatus Sturm, 1845		CK			N	X	X	CK	
Cryptophagus scanicus (Linnaeus, 1758)	H	CK	X	CK	B	X	X	CK	LC
Cryptophagus schroetteri Reitter, 1912								B	DD
Cryptophagus setulosus Sturm, 1845					CK				DD
Cryptophagus sporadum Bruce, 1934	X								DD
Cryptophagus uncinatus Stephens, 1830	H	CK	X	CK	CK	N		CK	LC
Henoticus serratus (Gyllenhal, 1808)	H	X					X		LC
Micrambe abietis (Paykull, 1798)						N	X	B	DD
Micrambe ulicis (Stephens, 1830)	H	X				N		CK	
Micrambe umbripennis (Reitter, 1888)								B	DD
Micrambe woodroffei C. Johnson, 2007	CK	X		N		N	CK	CK	
Paramecosoma melanocephalum (Herbst, 1793)						CK		N	LC
Pteryngium crenulatum (Erichson, 1846)						CK			LC
Telmatophilinae Jacquelin du Val, 1858									
Telmatophilus brevicollis Aubé, 1862		B	X						
Telmatophilus caricis (A.G. Olivier, 1790)		X	X					CK	
Telmatophilus typhae (Fallén, 1802)		B	X					N	
Atomariinae LeConte, 1861 **Atomariini** LeConte, 1861									
Atomaria affinis (R.F. Sahlberg, 1834)	CK					CK			
Atomaria analis Erichson, 1846	H		N	CK	CK	N		N	
Atomaria apicalis Erichson, 1846	H	X	X		B		X		
Atomaria atricapilla Stephens, 1830	H	N	CK	CK	N	CK	CK	CK	
Atomaria gibbula Erichson, 1846					CK				
Atomaria gravidula Erichson, 1846			N	N		N			
Atomaria gutta Newman, 1834		X							
Atomaria impressa Erichson, 1846								CK	
Atomaria linearis Stephens, 1830			X						DD
Atomaria nigripennis (Kugelann, 1794)					N				
Atomaria nigrirostris Stephens, 1830	H	N	X	N	N	CK	CK	CK	LC
Atomaria nigriventris Stephens, 1830	CK				CK		CK		
Atomaria ornata Heer, 1841						N		CK	
Atomaria pallidipennis Holdhaus, 1903		N			N				
Atomaria parvula Reitter, 1875 [E]					CK	CK			
Atomaria pulchra Erichson, 1846			X						
Atomaria puncticollis C.G. Thomson, 1868					CK				

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Atomaria pusilla (Paykull, 1798)	H		X	N	CK	X	X	CK	
Atomaria rubida Reitter, 1875	X	X					CK		
Atomaria scutellaris Motschulsky, 1849	H	X	CK	CK	CK	N	X	N	
Atomaria slavonica C. Johnson, 1971		X			CK	X		CK	
Atomaria testacea Stephens, 1830	H	X	X	N	B	X	X	CK	
Curelius exiguus (Erichson, 1846)	CK	X	X		N			CK	LC
Curelius japonicus (Reitter, 1878)		N			N			CK	
Ephistemus globulus (Paykull, 1798)	X	X	X		CK	CK	X	CK	
Ephistemus reitteri Casey, 1900			N		N				
Ootypus globosus Waltl, 1838			X					N	
Hypocoprinae Reitter, 1879									
Hypocoprus lathridioides Motschulsky, 1839					B				
SILVANIDAE Kirby, 1837									
Brontinae Erichson, 1845									
Brontini Erichson, 1845									
Halstead, Löbl & Jelínek in Cat. Pal. Col., vol. 4, 2007									
Uleiota planatus (Linnaeus, 1761)	H	X	X			X	X	N	LC
Telephanini LeConte, 1861									
Psammoecus bipunctatus (Fabricius, 1792)	X	X	X			X		N	
Silvaninae Kirby, 1837									
Ahasverus advena (Waltl, 1834)	X	X	X	N	N	X		N	
Airaphilus calabricus Obenberger, 1914 [E]								B	
Airaphilus elongatus (Gyllenhal, 1813)	X	X	X	N	N			N	
Airaphilus talpa (Kraatz, 1862) [E]	B	B							
Oryzaephilus surinamensis (Linnaeus, 1758)	X	X	X	N	N	X		B	
Silvanus unidentatus (A.G. Olivier, 1790)	H	X	X	N	B	X	X	N	LC
CUCUJIDAE Latreille, 1802									
Wegrzynowic in Cat. Pal. Col., vol. 4, 2007									
Cucujus cinnaberinus (Scopoli, 1763)						B	X	B	VU
Cucujus haematodes (Erichson, 1845)						B	B	B	EN
Cucujus tulliae Bonacci, Mazzei, Horák & Brandmayr, 2012 [E]							B		EN
Pediacus dermestoides (Fabricius, 1792)	H		N		B	X	B		NT
PHALACRIDAE Leach, 1815									
Phalacrinae Leach, 1815									
Švec in Cat. Pal. Col., vol. 4, 2007									
Olibrus aenescens Küster, 1852				B				N	
Olibrus aeneus (Fabricius, 1792)		B							
Olibrus affinis (Sturm, 1807)	H	B	X	B	B	B	B	B	
Olibrus bicolor (Fabricius, 1792)	X				B	B	X		
Olibrus bimaculatus Küster, 1848					B	B	B		
Olibrus bisignatus (Ménétriés, 1849)						X	B	B	
Olibrus castaneus Baudi di Selve, 1870		B			B	B	N	N	
Olibrus corticalis (Panzer, 1797)							B		
Olibrus demarzoi Švec & Angelini, 1996	B								
Olibrus fallax Flach, 1888		B						N	
Olibrus flavicornis (Sturm, 1807)	H		X	B	B	B	B	N	
Olibrus liquidus Erichson, 1845	H	B	X		B	B	B	B	
Olibrus millefolii (Paykull, 1800)			X	B	N	B	B	N	
Olibrus pygmaeus (Sturm, 1807)	H	B		B	B	B			
Olibrus reitteri Flach, 1888		B	X			B			
Olibrus stierlini Flach, 1888	H		X	N	N	B			

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Phalacrus corruscus (Panzer, 1797)		B	X	B	B	B	B	B	
Phalacrus fimetarius (Fabricius, 1775)	H	B	X	B	B	N		N	
Stilbus atomarius (Linnaeus, 1767)	H								
Stilbus oblongus (Erichson, 1845)			N			B			
Stilbus testaceus (Panzer, 1797)	H	B	X	B	N	B		N	
Tolyphus granulatus (Guérin-Méneville, 1834)			X		B	B		N	
Tolyphus punctulatus Rosenhauer, 1856	X	X			B	X			

LAEMOPHLOEIDAE Ganglbauer, 1899

Laemophloeinae Ganglbauer, 1899

Wegrzynowic in Cat. Pal. Col., vol. 4, 2007

Cryptolestes capensis (Waltl, 1834)	X	X							
Cryptolestes duplicatus (Waltl, 1839)	H	X			B	N		N	NT
Cryptolestes ferrugineus (Stephens, 1831)	H	X			CK	X	X	N	LC
Cryptolestes fractipennis (Motschulsky, 1845)	X	B		N	B	B	X		LC
Cryptolestes spartii (Curtis, 1834)		X				X		N	LC
Laemophloeus monilis (Fabricius, 1787)	X	X			N	X	X	N	LC
Laemophloeus nigricollis P.H. Lucas, 1849		B	X			B			NT
Leptophloeus juniperi (Grouvelle, 1874)	B	X							LC
Placonotus testaceus (Fabricius, 1787)	H	X	X	N	N	X	X	B	

CYBOCEPHALIDAE Jacquelin du Val, 1858

Jelínek & Audisio in Cat. Pal. Col., vol. 4, 2007; Cline et al., 2014

Cybocephalus rufifrons rufifrons Reitter, 1874		B				N		N	

COCCINELLOIDEA Latreille, 1807

Robertson et al., 2015

BOTHRIDERIDAE Erichson, 1845

Bothriderinae Erichson, 1845

Ślipiński in Cat. Pal. Col., vol. 4, 2007; Robertson et al., 2015

Bothrideres bipunctatus (Gmelin, 1790)	X				B	X	X	B	NT
Ogmoderes angusticollis (C.N.F. Brisout de Barneville, 1862)					N				NT

TEREDIDAE Seidlitz, 1888

Anommatinae Ganglbauer, 1899

Ślipiński in Cat. Pal. Col., vol. 4, 2007; Robertson et al., 2015

Anommatus duodecimstriatus (P.W.J. Müller, 1821)	H	X			N			N	

Teredinae Seidlitz, 1888

Oxylaemus cylindricus (Creutzer, 1796)	X			N		X		N	NT
Teredus cylindricus (A.G. Olivier, 1790)	X	X			N	X		N	LC

CERYLONIDAE Billberg, 1820

Ceryloninae Billberg, 1820

Ślipiński in Cat. Pal. Col., vol. 4, 2007; Robertson et al., 2015

Cerylon fagi C.N.F. Brisout de Barneville, 1867	X	X		N	N	X	X	N	LC
Cerylon ferrugineum Stephens, 1830	H			N	N	X	X	N	LC
Cerylon histeroides (Fabricius, 1792)	H	X		N	N	X	X	N	LC
Cerylon impressum Erichson, 1845					N				NT
Philothermus evanescens (Reitter, 1876)	H	N			N	X	X		NT
Philothermus semistriatus (Perris, 1865)	H	X	N		N	X		N	LC

LATRIDIIDAE Erichson, 1842

Latridiinae Erichson, 1842

Latridiini Erichson, 1842

Johnson in Cat. Pal. Col., vol. 4, 2007; Robertson et al., 2015; Otero & Lopez, 2016; Rücker, 2018

Cartodere constricta (Gyllenhal, 1827)							X		LC

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Cartodere nodifer (Westwood, 1839)	H	X		B	B	X	X	B	LC
Dienerella anatolica (Mannerheim, 1844)	N	B	N		B	N		B	LC
Dienerella angelinii Rücker, 1998 [E]				N	B	B	B	B	
Dienerella clathrata (Mannerheim, 1844)								B	LC
Dienerella elegans (Aubé, 1850)								B	LC
Dienerella elongata (Curtis, 1830)	H	X		B	B	X	X	B	LC
Dienerella parilis (Rey, 1889)	X		B	B	B	X	X	B	LC
Dienerella polyhymnia Rücker & Poggi, 2013	B		B	B	B	B	B	B	LC
Dienerella ruficollis (Marsham, 1802)								N	LC
Dienerella siciliana Vincent, 1990 [E]							X		DD
Enicmus atriceps V. Hansen, 1962								B	DD
Enicmus brevicornis (Mannerheim, 1844)	X	X				X	X	B	LC
Enicmus fungicola C.G. Thomson, 1868	X	X						B	LC
Enicmus histrio Joy & Tomlin, 1910		X	X		B	X		B	LC
Enicmus rugosus (Herbst, 1793)	H	X		B	B	X	X	B	LC
Enicmus testaceus (Stephens, 1830)	X				B	B	X	B	LC
Enicmus transversus (A.G. Olivier, 1790)	H	X	X	B	B	X	X	B	LC
Latridius assimilis (Mannerheim, 1844)								B	DD
Latridius brevicollis (C.G. Thomson, 1868)	X	X			B	X	X	B	DD
Latridius consimilis (Mannerheim, 1844)					B	X		N	LC
Latridius minutus (Linnaeus, 1767)	X	X	X	N	B	X	X	B	LC
Latridius porcatus Herbst, 1793	B		X	N	B	X			
Metophthalmus solarii Binaghi, 1946					B			B	DD
Revelieria genei (Aubé, 1850)								B	LC
Stephostethus angusticollis (Gyllenhal, 1827)		B			B			B	LC
Stephostethus productus (Rosenhauer, 1856)		X							DD
Corticariinae Curtis, 1829									
Corticaria crenulata (Gyllenhal, 1827)					N				LC
Corticaria cucujiformis Reitter, 1880		X	B						DD
Corticaria elongata (Gyllenhal, 1827)			X		B			N	LC
Corticaria fagi Wollaston, 1854			X						
Corticaria fulva (Comolli, 1837)	X					X			LC
Corticaria laertes Rücker, 2006		B	B			N			
Corticaria obscura C.N.F. Brisout de Barneville, 1863			X	B	B	X	X	B	
Corticaria olympiaca Reitter, 1875	H								
Corticaria pineti Lohse, 1960	X	X							LC
Corticaria pubescens (Gyllenhal, 1827)	H	X				N		B	LC
Corticaria saginata Mannerheim, 1844			B						LC
Corticaria serrata (Paykull, 1798)		X			N	X	X	B	LC
Corticarina curta (Wollaston, 1854)	N	N	N		N	N		N	
Corticarina similata (Gyllenhal, 1827)	X	X	X					B	LC
Cortinicara gibbosa (Herbst, 1793)	H	X	X	N	N	X	X	B	LC
Melanophthalma distinguenda (Comolli, 1837)	H	B	X	N	B	B	X	B	LC
Melanophthalma extensa Rey, 1889		B			B				
Melanophthalma fuscipennis (Mannerheim, 1844)	H	X	X	N	B	X		B	LC
Melanophthalma maura Motschulsky, 1866			B		B			B	LC
Melanophthalma parvicollis (Mannerheim, 1844)		B				B			
Melanophthalma rispini Rücker & C. Johnson, 2007		B							
Melanophthalma sericea (Mannerheim, 1844)		X	X						LC
Melanophthalma suturalis (Mannerheim, 1844)		B	X	N	B		X	B	LC
Melanophthalma taurica (Mannerheim, 1844)	X	X	X		B	X	X	N	LC
Melanophthalma transversalis (Gyllenhal, 1827)	H	X							
Migneauxia crassiuscula (Aubé, 1850)		X	X	N	B	N		B	LC

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Migneauxia lederi Reitter, 1875								B	
Migneauxia ottoi C. Johnson, 2007					N			N	
ALEXIIDAE Imhoff, 1856									
Tomaszewska in Cat. Pal. Col., vol. 4, 2007; Robertson et al., 2015									
Sphaerosoma globosum (Sturm, 1807)								N	LC
Sphaerosoma reitteri (Ormay, 1888)				N	N	N		B	LC
Sphaerosoma solarii Reitter, 1904 [E]	N			B	N	N	X	N	LC
Sphaerosoma sparsum Reitter, 1909 [E]	N			N	N	N	N	B	LC
Sphaerosoma vallombrosae (Reitter, 1885) [E]	N				N	N		N	LC
CORYLOPHIDAE LeConte, 1852									
Corylophinae LeConte, 1852									
Corylophini LeConte, 1852									
Bowestead in Cat. Pal. Col., vol. 4, 2007; Robertson et al., 2015									
Corylophus cassidoides (Marsham, 1802)		X	X			N			
Corylophus sublaevipennis Jacquelin du Val, 1859	H	X				N			DD
Parmulini Poey, 1854									
Arthrolips convexiuscula (Motschulsky, 1849)		B	X	N	N	N		N	
Arthrolips hetschkoi (Reitter, 1913)						B			
Arthrolips nana (Mulsant & Rey, 1861)						X	X		DD
Arthrolips obscura (C.R. Sahlberg, 1833)	X	N			N	B	X	B	DD
Arthrolips picea (Comolli, 1837)	H	B	X	N	N	N		B	
Clypastraea reitteri Bowestead, 1999					B	B	N	B	DD
Sericoderini Matthews, 1888									
Aposericoderus revelierei Reitter, 1878		B				X			
Sericoderus lateralis (Gyllenhal, 1827)	H	X	X	N	B	X	X	N	
Orthoperinae Jacquelin du Val, 1857									
Orthoperus aequalis Sharp, 1885		B						N	DD
Orthoperus anxius Mulsant & Rey, 1861			X						
Orthoperus atomus (Gyllenhal, 1808)	B	B							DD
Orthoperus brunnipes (Gyllenhal, 1808)						N			
Orthoperus corticalis (L. Redtenbacher, 1845)					B	N		B	DD
Orthoperus nigrescens Stephens, 1829	H								
Rypobiinae Paulian, 1950									
Gloeosomatini Bowestead, 1999									
Gloeosoma velox Wollaston, 1854	B	N						B	
Rypobiini Paulian, 1950									
Rypobius fiorianus Matthews, 1886			B					B	
ANAMORPHIDAE Strohecker, 1953									
Tomaszewska in Cat. Pal. Col., vol. 4, 2007; Robertson et al., 2015									
Aclemmysa solarii Reitter, 1904 [E]			X	B	B	N		N	NT
Mychothenus minutus (Frivaldszky, 1877)						N			NT
Symbiotes gibberosus (P.H. Lucas, 1846)	X	X		N		N		N	LC
ENDOMYCHIDAE Leach, 1815									
Endomychinae Leach, 1815									
Tomaszewska in Cat. Pal. Col., vol. 4, 2007; Robertson et al., 2015									
Endomychus coccineus (Linnaeus, 1758)	N			N	N	X	X	B	LC
Leiestinae C.G. Thomson, 1863									
Leiestes seminiger (Gyllenhal, 1808)						N		B	VU
Lycoperdininae L. Redtenbacher, 1844									
Ancylopus melanocephalus (A.G. Olivier, 1808)	X	X						N	

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Dapsa opuntiae Reitter, 1884	H	X	N	B	B	B	B	B	
Dapsa trimaculata Motschulsky, 1835		X						N	
Lycoperdina bovistae (Fabricius, 1792)	H	X		N	N	X	X	N	LC
Lycoperdina validicornis Gerstaecker, 1858	X	X				X	X	N	VU
Mycetina cruciata (Schaller, 1783)	X	X		N	N	X	X	N	LC
Merophysiinae Seidlitz, 1872 **Merophysiini** Seidlitz, 1872 Rücker & Löbl in Cat. Pal. Col., vol. 4, 2007; Robertson et al., 2015; Rücker, 2018									
Cholovocera attae (Kraatz, 1858)						N		N	
Cholovocera fleischeri Reitter, 1902		B						N	
Cholovocera formicaria Motschulsky, 1838	H							B	
Cholovocera punctata Märkel, 1844					B	N		N	
Merophysia formicaria P.H. Lucas, 1852						N		N	
Merophysia oblonga Kiesenwetter, 1872	H	B			B			B	
Holoparamecini Seidlitz, 1888									
Holoparamecus caularum (Aubé, 1843)	X	X				X			
Holoparamecus depressus Curtis, 1833		B							
Holoparamecus niger (Aubé, 1843)	X	X			N	B		B	
Holoparamecus ragusae Reitter, 1875		B							
Holoparamecus singularis (Beck, 1817)		X							
MYCETAEIDAE Jacquelin du Val, 1857 Tomaszewska in Cat. Pal. Col., vol. 4, 2007; Robertson et al., 2015									
Mycetaea subterranea (Fabricius, 1801)	N				N	X	X	N	LC
COCCINELLIDAE Latreille, 1807 **Coccinellinae** Latreille, 1807 **Chilocorini** Mulsant, 1846 Kovář in Cat. Pal. Col., vol. 4, 2007; Seago et al., 2011; Robertson et al., 2015									
Chilocorus bipustulatus (Linnaeus, 1758)	H	X	X	N		X	X	N	
Exochomus quadripustulatus (Linnaeus, 1758)	X	N	X	N	N	X	X	N	
Parexochomus nigromaculatus (Goeze, 1777)		X	N			N			
Coccidulini Mulsant, 1846									
Clitostethus arcuatus (P. Rossi, 1794)	H						X		
Coccidula rufa (Herbst, 1783)	X	N	X					N	
Coccidula scutellata (Herbst, 1783)	H		X	N		N			
Nephus bipunctatus (Kugelann, 1794)	H					X			
Nephus bisignatus bisignatus (Boheman, 1850)			X						
Nephus kiesenwetteri (Mulsant, 1850)		X							
Nephus nigricans nigricans (J. Weise, 1879)	X			N		X	X	N	
Nephus quadrimaculatus (Herbst, 1783)	H	X				X	X		
Nephus schatzmayri Canepari & Tedeschi, 1977				B	B				
Rhyzobius litura (Fabricius, 1787)	H	X	X	B	N	X	X	N	
Rhyzobius lophantae (Blaisdéll, 1892)					N	X		N	
Scymniscus anomus (Mulsant & Rey, 1852)	N	X	B		B				
Scymniscus helgae (Fürsch, 1965)								B	
Scymniscus tristiculus (J. Weise, 1929)								B	
Scymnus apetzi Mulsant, 1846	B	X	X	N	N	X	X	N	
Scymnus ater Kugelann, 1794	H	N							
Scymnus auritus Thunberg, 1795	H	N	X	N	N	X	X	N	
Scymnus bivulnerus Baudi di Selve, 1894		X	X					B	
Scymnus femoralis (Gyllenhal, 1827)			X					N	
Scymnus ferrugatus (Moll, 1785)	H								
Scymnus flagellisiphonatus (Fürsch, 1970)		X	X					N	

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Scymnus fraxini Mulsant, 1850			X		N			N	
Scymnus frontalis (Fabricius, 1787)	H	X	X	N	N	X	X	N	
Scymnus haemorrhoidalis Herbst, 1797			X						
Scymnus impexus Mulsant, 1850					N				
Scymnus inderihensis Mulsant, 1850		X							
Scymnus interruptus (Goeze, 1777)	H	X	X		N	N	X	N	
Scymnus limbatus Stephens, 1832			X						
Scymnus marginalis (P. Rossi, 1794)	X	X			N	X	X	B	
Scymnus marinus (Mulsant, 1850)	X	X	X	N	N	X	X	N	
Scymnus pharaonis Motschulsky, 1851			X					N	
Scymnus rubromaculatus (Goeze, 1777)	H	X	X	N	N	X	X	N	
Scymnus rufipes (Fabricius, 1798)		X	X					N	
Scymnus sacium (Roubal, 1927)					N				
Scymnus subvillosus (Goeze, 1777)	H	X	X	N	N	X	X	N	
Scymnus suffrianioides apetzoides Capra & Fürsch, 1967	N						X		
Scymnus suturalis Thunberg, 1795					N	X	X		
Stethorus gilvifrons (Mulsant, 1850)	H	X	X		N	N			
Stethorus pusillus (Herbst, 1797)	X	X	X	N	N	X			
Coccinellini Latreille, 1807									
Adalia bipunctata (Linnaeus, 1758)	H	X	X	B	N	X	X	N	
Adalia decempunctata (Linnaeus, 1758)	X	X	X	N	N	X	X	N	
Anatis ocellata (Linnaeus, 1758)							X		
Anisosticta novemdecimpunctata (Linnaeus, 1758)	X	X				X	X		
Aphidecta obliterata (Linnaeus, 1758)							X	N	
Calvia quatuordecimguttata (Linnaeus, 1758)			X	N	N	X	X	N	
Ceratomegilla undecimnotata (D.H. Schneider, 1792)	X		X	B			X		
Coccinella hieroglyphica hieroglyphica Linnaeus, 1758							X		
Coccinella septempunctata Linnaeus, 1758	H	X	X	B	N	X	X	N	
Coccinella undecimpunctata undecimpunctata Linnaeus, 1758	H								
Coccinula quatuordecimpustulata (Linnaeus, 1758)	H	X	X	B	N	X	X	N	
Halyzia sedecimguttata (Linnaeus, 1758)	X		X	N	N	X	X	N	
Harmonia quadripunctata (Pontoppidan, 1763)	X	X	X	N		X	X		
Hippodamia variegata (Goeze, 1777)	H	X	X	N	N	X	X	N	
Myrrha octodecimguttata (Linnaeus, 1758)	H					X	X		
Myzia oblongoguttata oblongoguttata (Linnaeus, 1758)							X		
Oenopia conglobata conglobata (Linnaeus, 1758)	H	N	X	N	N	X	X		
Oenopia doublieri (Mulsant, 1846)	H	X				N			
Oenopia lyncea agnata (Rosenhauer, 1847)				N					
Oenopia lyncea lyncea (A.G. Olivier, 1808)	X		X		N	X	X	N	
Psyllobora vigintiduopunctata (Linnaeus, 1758)	H	X	X	N	N	X	X	N	
Sospita vigintiguttata (Linnaeus, 1758)						X	X	N	
Tytthaspis sedecimpunctata (Linnaeus, 1758)		X	X		N	N	X	N	
Vibidia duodecimguttata (Poda von Neuhaus, 1761)	H	X	X		N	X	X	B	
Diomini R.D. Gordon, 2000									
Diomus rubidus (Motschulsky, 1837)	X	X						N	
Epilachnini Mulsant, 1850									
Chnootriba elaterii elaterii (P. Rossi, 1794)		X							
Henosepilachna vigintioctomaculata Motschulsky, 1858	H							B	
Subcoccinella vigintiquatuorpunctata (Linnaeus, 1758)	H	X	X	B	N	X	X	N	
Hyperaspidini Mulsant, 1846									
Hyperaspis campestris (Herbst, 1783)	X				N				
Hyperaspis concolor (Suffrian, 1843)			X	N		B	X	B	
Hyperaspis duvergeri Fürsch, 1985	X	X	X				X	B	

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Hyperaspis peezi Fürsch, 1976						B	B	B	
Hyperaspis stigma (A.G. Olivier, 1808)		N	X						
Noviini Mulsant, 1850									
Rodolia cardinalis (Mulsant, 1850)		X							
Platynaspidini Mulsant, 1846									
Platynaspis luteorubra Goeze, 1777		X	X	N	N	X	X		
TENEBRIONOIDEA Latreille, 1802									
MYCETOPHAGIDAE Leach, 1815									
Mycetophaginae Leach, 1815									
Mycetophagini Leach, 1815									
Nikitsky in Cat. Pal. Col., vol. 5, 2008									
Litargus balteatus Leconte, 1856	N				N	N	N	N	
Litargus coloratus Rosenhauer, 1856	X	X							NT
Litargus connexus (Geoffroy, 1785)	X	X	X	N	N	X	X	N	LC
Mycetophagus atomarius (Fabricius, 1787)	H			N	N	X	X	N	LC
Mycetophagus fulvicollis Fabricius, 1792		N							NT
Mycetophagus quadriguttatus P.W.J. Müller, 1821				N					LC
Mycetophagus quadripustulatus (Linnaeus, 1760)	X	X			N	X	X	N	LC
Pseudotriphyllus suturalis (Fabricius, 1801)		X					X		NT
Triphyllus bicolor (Fabricius, 1777)	X				N	X	X	N	LC
Typhaea stercorea (Linnaeus, 1758)	H	X	X	N	N	X	X	N	LC
Typhaeola umbrata (Baudi di Selve, 1870)		N		N	N	B		B	LC
Bergininae Lend, 1920									
Berginus tamarisci Wollaston, 1854	X	X	X	N		N	X	N	LC
Esarcinae Reitter, 1882									
Esarcus fiorii Reitter, 1887 [E]		N						B	VU
CIIDAE Leach, 1819									
Ciinae Leach, 1819									
Ciini Leach, 1819									
Jelinek in Cat. Pal. Col., vol. 5, 2008; Reibnitz et al., 2013									
Cis bidentatus (A.G. Olivier, 1790)								N	LC
Cis boleti (Scopoli, 1763)	H	X		N	N	X	X	N	LC
Cis castaneus (Herbst, 1793)	X	N	N	N	N	X	X	N	LC
Cis comptus Gyllenhal, 1827	H	X		N	N	X			LC
Cis dentatus Mellié, 1849						X			LC
Cis fissicollis Mellié, 1849			X		N	N			LC
Cis glabratus Mellié, 1849						N			LC
Cis hanseni A. Strand, 1965	N				N	N			VU
Cis jacquemartii Mellié, 1849						N			LC
Cis lineatocribratus Mellié, 1849	H	X		N	N	X	X	N	LC
Cis micans (Fabricius, 1792)	H	X		N	N	X	X	N	LC
Cis pygmaeus pygmaeus (Marsham, 1802)	X								VU
Cis quadridentulus Perris, 1874		N							LC
Cis rugulosus Mellié, 1849		X			N	N			LC
Cis vestitus Mellié, 1849	H	X				X	X	N	LC
Ennearthron cornutum (Gyllenhal, 1827)						X			LC
Ennearthron palmi Lohse, 1966						N			
Ennearthron pruinosulum (Perris, 1864)						N			VU
Orthocis alni (Gyllenhal, 1813)						N			
Orthocis reflexicollis (Abeille de Perrin, 1874)		N							VU
Strigocis bicornis (Mellié, 1849)	H	X		N		X	X	N	LC

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Sulcacis bidentulus (Rosenhauer, 1847)						N			LC
Sulcacis fronticornis (Panzer, 1805)		X				N			LC
Sulcacis nitidus (Fabricius, 1792)		X		N		X	X	N	LC
Orophiini C.G. Thomson, 1863									
Octotemnus glabriculus (Gyllenhal, 1827)		X	X	N	N	X	X	N	LC
Octotemnus mandibularis (Gyllenhal, 1813)	X								VU
Ropalodontus baudueri Abeille de Perrin, 1874								N	EN
Ropalodontus novorossicus Reitter, 1902		X							EN
Ropalodontus perforatus (Gyllenhal, 1813)	X	X	X	N	N	X	X	N	LC
Xylographus bostrichoides (Dufour, 1843)	X	X			N	X			
TETRATOMIDAE Billberg, 1820									
Eustrophinae Gistel, 1856									
Eustrophini Gistel, 1856									
Nikitsky in Cat. Pal. Col., vol. 5, 2008									
Eustrophus dermestoides (Fabricius, 1792)					N			N	NT
Hallomeninae Mulsant, 1856									
Hallomenus binotatus (Quensel, 1790)							X	N	NT
MELANDRYIDAE Leach, 1815									
Melandryinae Leach, 1815									
Dircaeini Mulsant, 1856									
Nikitsky & Pollock in Cat. Pal. Col., vol. 5, 2008									
Abdera quadrifasciata (Curtis, 1829)	X	X				X	X	N	NT
Phloiotrya tenuis (Hampe, 1850)	X	X				B	X	N	NT
Melandryini Leach, 1815									
Melandrya barbata (Fabricius, 1787)						B?	B		NT
Melandrya caraboides (Linnaeus, 1760)	X				N	B	X	B	NT
Orchesiini Mulsant, 1856									
Orchesia micans (Panzer, 1793)								B	LC
Orchesia undulata Kraatz, 1853						X	X	N	LC
Serropalpini Latreille, 1829									
Serropalpus barbatus (Schaller, 1783)						X		B	NT
Xylitini C.G. Thomson, 1864									
Rushia parreyssii (Mulsant, 1856)							X	B	NT
Osphyinae Mulsant, 1856									
Conopalpus brevicollis Kraatz, 1855								B	NT
Osphya bipunctata (Fabricius, 1775)				N	N	X	X		LC
MORDELLIDAE Latreille, 1802									
Mordellinae Latreille, 1802									
Mordellini Latreille, 1802									
Horák in Cat. Pal. Col., vol. 5, 2008									
Falsopseudotomoxia argyropleura (Franciscolo, 1942)	B								
Iberomorda sulcicauda (Mulsant, 1856)							B		
Mediimorda bipunctata (Germar, 1827)	H	X				X			
Mordella aculeata Linnaeus, 1758	H							B	
Mordella holomelaena holomelaena Apfelbeck, 1914	X					X	X		
Mordella leucaspis leucaspis Küster, 1849	X	X				X	X		
Mordella meridionalis Méquignon, 1946						X			
Mordella purpurascens Apfelbeck, 1914	X					X			
Mordellaria aurofasciata (Comolli, 1837)						B			
Variimorda briantea (Comolli, 1837)	X	X			B	N	X		

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Variimorda ragusai (Emery, 1876)	X	X			B	B	X		
Variimorda villosa (Schrank, 1781)		X	B			X	X		
Mordellistenini Ermisch, 1941									
Mordellistena austriaca Schilsky, 1899		X				X	X		
Mordellistena brevicauda (Boheman, 1849)	H					X			
Mordellistena emeryi Schilsky, 1895		X				X	X		
Mordellistena episternalis Mulsant, 1856	H					X			
Mordellistena falsoparvula Ermisch, 1956					B	B			
Mordellistena humeralis Fabricius, 1758	H		N						
Mordellistena micans (Germar, 1817)	H					X			
Mordellistena minima A. Costa, 1854		X				X	X		
Mordellistena neuwaldeggiana (Panzer, 1796)		X							
Mordellistena paraepisternalis Ermisch, 1965	N	X							
Mordellistena paraintersecta Ermisch, 1956	X				B				
Mordellistena parvula (Gyllenhal, 1827)	X					X			
Mordellistena pseudohirtipes pseudohirtipes Ermisch, 1965	X	X				X	X		
Mordellistena pumila (Gyllenhal, 1810) gr.	H	X		B		X	X		
Mordellistena stenidea Mulsant, 1856						X			
Mordellistena subepisternalis Ermisch, 1965	X	X							
Mordellistena tarsata Mulsant, 1856	X					X			
Mordellistenula perrisi (Mulsant, 1857)						X	X		
Mordellistenula planifrons Stshegoleva-Barovskaya, 1930							X		
Mordellochroa abdominalis (Fabricius, 1775)		X							LC
Mordellochroa pulchella (Mulsant & Rey, 1859)	B								
Stenaliini Franciscolo, 1955									
Stenalia bisecta Baudi di Selve, 1883 [E]		B							
Stenalia testacea testacea (Fabricius, 1787)	X	X				N	B	B	
RIPIPHORIDAE Gemminger & Harold, 1870									
Ptilophorinae Gerstaecker, 1855									
Batelka in Cat. Pal. Col., vol. 5, 2008									
Ptilophorus dufourii (Latreille, 1817)	H	X			N			N	
Ripiphorinae Gemminger & Harold, 1870									
Ripiphorini Reitter, 1911									
Rhipiphorus subdipterus Bosc, 1792								B	
ZOPHERIDAE Solier, 1834									
Zopherinae Solier, 1834									
Pycnomerini Erichson, 1845									
Ślipiński & Schuh in Cat. Pal. Col., vol. 5, 2008									
Pycnomerus italicus (Ganglbauer, 1899)		N		N	N	N	X	N	EN
Pycnomerus terebrans (A.G. Olivier, 1790)						X			NT
Colydiinae Erichson, 1842									
Colydiini Erichson, 1842									
Aulonium ruficorne (A.G. Olivier, 1790)	X	X							LC
Colydium elongatum (Fabricius, 1787)					N	N	B		LC
Colydium filiforme Fabricius, 1792	X						X	N	NT
Synchitini Erichson, 1845									
Bitoma crenata (Fabricius, 1775)	H	X	X	N	N	X	X	N	LC
Colobicus hirtus (P. Rossi, 1790)	X	X				X		N	NT
Corticus celtis (Germar, 1824)	H	X	X	N	N	X	X	B	LC
Coxelus pictus (J. Sturm, 1807)				N	N	X	X	N	LC
Diodesma denticincta Abeille de Perrin, 1899				N	B	N	N	N	NT

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Endophloeus markovichianus (Piller & Mitterpacher, 1783)	H	X			N	X	X	N	NT
Langelandia anophthalma Aubé, 1842		N			N	N		N	LC
Langelandia ausonica Obenberger, 1914 [E]		N		N	N	N		N	CR
Langelandia reitteri Belon, 1882	N				N			N	NT
Nosodomodes tuberculatus (Germar, 1832)					N	N			DD
Synchita mediolanensis A. Villa & G.B. Villa, 1833					N				LC
Synchita separanda (Reitter, 1882)	N								NT
Synchita undata Guérin-Méneville, 1844	H								NT
Synchita variegata Hellwig, 1792	X	X	X	N	N	X	X	N	LC
Tarphius gibbulus Erichson, 1845 [E]	X			N	N	X	X	N	NT

TENEBRIONIDAE Latreille, 1802

Lagriinae Latreille, 1825

Belopini Reitter, 1917

Löbl, Merkl, Ando, Bouchard, Lillig, Masomutu & Schawaller in Cat. Pal. Col., vol. 5, 2008

Centorus elongatus ecalcaratus (Seidlitz, 1896)								N	
Centorus crassipes crassipes (Fischer von Waldheim, 1844)	X								

Cossyphini Latreille, 1802

Cossyphus moniliferus moniliferus Chevrolat, 1829								B	
Cossyphus tauricus Steven, 1832		X						B	

Lagriini Latreille, 1825

Lagriina Latreille, 1825

Merkl in Cat. Pal. Col., vol. 5, 2008

Lagria atripes Mulsant & Guillebeau, 1855	X	X			N	X	X	B	
Lagria hirta (Linnaeus, 1758)	H	X	X	B	N	X	X	B	
Lagria rugosula Rosenhauer, 1856								B	

Pimeliinae Latreille, 1802

Akidini Billberg, 1820

Akis trilineata Herbst, 1799	x	x						B	
Akis subterranea Solier, 1836								B	

Asidini Fleming, 1821

Soldati in Cat. Pal. Col., vol. 5, 2008

Alphasida grossa grossa (Solier, 1836) [E]								B	
Asida bayardi bayardi Solier, 1836 [E]	B			B	B	X			
Asida calabra Leoni, 1909 [E]						B	X	B	
Asida fascicularis fiorii Leoni, 1909 [E]	H								
Asida goryi Solier, 1836 [E]								B	
Asida novasiriensis Grimm, 1985 [E]		N	X						
Asida piligera Leoni, 1909 [E]	B								

Boromorphini Skopin, 1978

Boromorphus italicus Gardini, 2010 [E]			B					B	

Cnemeplatiini Jacquelin du Val, 1861

Cnemeplatia atropos atropos A. Costa, 1847	X	X			N			N	

Elenophorini Solier, 1837

Elenophorus italicus (Ferrer, 2015)								B	

Erodiini Billberg, 1820

Erodius siculus dalmatinus Kraatz, 1865	X	X							
Erodius siculus neapolitanus Solier, 1834 [E]								B	

Pimeliini Latreille, 1802

Pimelia rugulosa apula Gridelli, 1950 [E]	X	X							
Pimelia rugulosa rugulosa Germar, 1824 [E]						B	X	B	

Stenosini Lacordaire, 1859

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Dichillus corsicus (Solier, 1838)						B	B	B	
Dichillus minutus (Solier, 1838)					B				
Dichillus pertusus (Kiesenwetter, 1861)								B	
Eutagenia elvirae Marcuzzi & Turchetto, 1982 [E]		N							
Stenosis brenthoides brenthoides (P. Rossi, 1790)	X	X		N		X	X	B	
Stenosis intermedia intermedia (Solier, 1838)	B	B		B	N	N	B	B	
Tentyriini Eschscholtz, 1831									
Pachychila dejeani dejeani (Besser, 1832)		N						B	
Pachychila italica Ferrer, 2018	x	x						B	
Tentyria grossa grossa Besser, 1832		X						B	
Tentyria italica Solier, 1835	H	X		B		B		B	
Tenebrioninae Latreille, 1802									
Alphitobiini Reitter, 1917									
Alphitobius diaperinus (Panzer, 1796)	X			N	N	X	X	N	
Diaclina fagi (Panzer, 1799)					N				DD
Diaclina testudinea (Piller & Mitterpacher, 1783)		X							EN
Blaptini Leach, 1815									
Blaptina Leach, 1815									
Löbl, Nabozhenko & Merkl in Cat. Pal. Col., vol. 5, 2008									
Blaps gibba Laporte, 1840	H	X	X	B	N	X	X	B	
Blaps gigas (Linnaeus, 1767)	B	X						B	
Blaps lethifera lethifera Marsham, 1802						X			
Blaps mucronata Latreille, 1804	X	X						B	
Bolitophagini Kirby, 1837									
Bolitophagina Kirby, 1837									
Bolitophagus interruptus Illiger, 1800	X	X				X	X		EN
Bolitophagus reticulatus (Linnaeus, 1767)	X	X		N	N	X	X	N	VU
Eledona agricola (Herbst, 1783)					N		X		NT
Eledonoprius armatus (Panzer, 1799)	B								CR
Eledonoprius serrifrons (Reitter, 1890)	B					B			CR
Helopini Latreille, 1802									
Cylindrinotina Espanol, 1956									
Nabozhenko & Löbl in Cat. Pal. Col., vol. 5, 2008									
Nalassus dermestoides (Illiger, 1798)	H								LC
Nalassus dryadophilus (Mulsant, 1854)	H	X		N	N	X	X	N	LC
Nalassus planipennis (Küster, 1850) [E]	H								LC
Nalassus plebejus (Küster, 1850)		X			N				CR
Odocnemis exaratus (Germar, 1817)	H								LC
Stenomax aeneus (Scopoli, 1763)	X				N	X	X	N	LC
Xanthomus pallidus (Curtis, 1830)		X							
Xanthomus pellucidus (Mulsant & Rey, 1856)		X							
Helopina Latreille, 1802									
Accanthopus velikensis (Piller & Mitterpacher, 1783)	H	X	X	B	N	X	X	B	LC
Catomus rotundicollis (Guérin-Méneville, 1825)	X	X						B	
Helops caeruleus caeruleus (Linnaeus, 1758)	X	X	X	N	N	X	X	B	LC
Helops rossii (Germar, 1817)	H	X						B	LC
Italohelops subchalybaeus (Reitter, 1907) [E]		X					X		NT
Probaticus anthrax (Seidlitz, 1896) [E]								B	DD
Probaticus sphaericollis (Küster, 1850 [E])		N	X					B	NT
Raiboscelis azureus azureus (Brullé, 1832)	B								DD
Melanimini Seidlitz, 1894									
Iwan & Löbl in Cat. Pal. Col., vol. 5, 2008									

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Melanimon tibialis tibialis (Fabricius, 1781)		X							
Opatrini Brullé, 1832 **Opatrina** Brullé, 1832 Iwan & Löbl in Cat. Pal. Col., vol. 5, 2008									
Ammobius rufus (P.H. Lucas, 1846)	X	X						B	
Gonocephalum granulatum pusillum (Fabricius, 1792)	H	X				X	X	B	
Gonocephalum obscurum obscurum (Küster, 1849)								B	
Gonocephalum prolixum (Erichson, 1843)	H							B	
Gonocephalum rusticum (A.G. Olivier, 1811)	B	N			N	N	X	B	
Opatroides punctulatus punctulatus Brullé, 1832								B	
Opatrum obesum A.G. Olivier, 1811		X						B	
Opatrum sabulosum sculptum Rey, 1892	B	X			N	X	X	B	
Opatrum verrucosum Germar, 1817	B				B	X		B	
Palorini Matthews, 2003									
Palorus depressus (Fabricius, 1790)	X	X		N	N	X	X	N	LC
Palorus ratzeburgii (Wissmann, 1848)		X							
Palorus subdepressus (Wollaston, 1864)					N				
Pedinini Eschscholtz, 1829 **Dendarina** Seidlitz, 1889 Iwan & Löbl in Cat. Pal. Col., vol. 5, 2008									
Dendarus dalmatinus (Germar, 1824)	H	X							
Dendarus lugens (Mulsant & Rey, 1854)				B		X	X	B	
Dendarus peslieri Soldati, 2012	x								
Leichenina Mulsant, 1854									
Leichenum pictum (Fabricius, 1801)	X	X						N	
Melambiina Mulsant & Rey, 1854									
Allophylax picipes (A.G. Olivier, 1811)	X							B	
Pedinina Eschscholtz, 1829									
Colpotus strigosus ganglbaueri D'Amore Fracassi, 1907					N	X			
Colpotus strigosus ragusae D'Amore Fracassi, 1907		X						B	
Colpotus strigosus strigosus (A. Costa, 1847)							X		
Pedinus helopioides Germar, 1814								B	
Pedinus meridianus Mulsant & Rey, 1853	H	N	X	B	N	X	X	N	
Pedinus ragusae Baudi di Selve, 1876								B	
Scaurini Billberg, 1820									
Scaurus striatus Fabricius, 1792	X	X					B	B	
Scaurus tristis A.G. Olivier, 1795	B							B	
Tenebrionini Latreille, 1802									
Neatus noctivagus (Mulsant & Rey, 1853)	X	X				X	X		VU
Tenebrio molitor Linnaeus, 1758	X	X				X		B	
Tenebrio obscurus Fabricius, 1792		X		N		X		B	LC
Triboliini Gistel, 1848									
Lyphia tetraphylla (Fairmaire, 1856)	X	X							EN
Ulomini Blanchard, 1845									
Uloma culinaris (Linnaeus, 1758)	X	X		N	N	X	X	N	LC
Uloma rufa (Piller & Mitterpacher, 1783)							X		EN
Diaperinae Latreille, 1802 **Crypticini** Brullé, 1832									
Oochrotus unicolor ardoini Canzoneri, 1961 [E]	H	X	X					N	
Pseudoseriscius helvolus adriaticus (Espanol, 1949)	X								
Pseudoseriscius helvolus helvolus (Küster, 1852)								B	
Diaperini Latreille, 1802									

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Alphitophagus bifasciatus (Say, 1824)		X	N		N	N	X		
Diaperis boleti boleti (Linnaeus, 1758)	X	X		N	N	X	X	N	LC
Gnathocerus cornutus (Fabricius, 1798)	X	X				X	X		
Neomida haemorrhoidalis (Fabricius, 1787)	X	X			N	X	X	N	EN
Pentaphyllus chrysomeloides (P. Rossi, 1792)	X	X	X		N	N	X	N	EN
Pentaphyllus testaceus (Hellwig, 1792)		N			N				EN
Platydema europaeum Laporte & Brullé, 1831							X		CR
Platydema violaceum (Fabricius, 1790)	X	X							NT
Hypophlaeini Billberg, 1820									
Corticeus bicolor (A.G. Olivier, 1790)	X	X				X	B	N	LC
Corticeus fasciatus Fabricius, 1790						X			LC
Corticeus fraxini (Kugelann, 1794)							X		
Corticeus pini (Panzer, 1799)	X	X					X	B	LC
Corticeus unicolor Piller & Mitterpacher, 1783	X	X		N	N	X	X	N	LC
Myrmechixenini Jacquelin du Val, 1858									
Myrmechixenus vaporariorum Guérin-Méneville, 1843		N	X		N	N	N	N	
Phaleriini Blanchard, 1845									
Phaleria acuminata acuminata Küster, 1852	X	X						N	
Phaleria bimaculata bimaculata (Linnaeus, 1767)		N						B	
Phtora crenata Germar, 1836		X							
Scaphidemini Reitter, 1922									
Scaphidema metallicum metallicum (Fabricius, 1792)	X	X		N	N	X	X	N	LC
Trachyscelini Blanchard, 1845									
Trachyscelis aphodioides aphodioides Latreille, 1809	X	X						N	
Alleculinae Laporte, 1840 **Alleculini** Laporte, 1840 **Alleculina** Laporte, 1840 Novák & Pettersson in Cat. Pal. Col., vol. 5, 2008									
Allecula morio (Fabricius, 1787)					N			N	LC
Hymenalia rufipes (Fabricius, 1792)			N						LC
Prionychus ater (Fabricius, 1775)		N	X					B	NT
Gonoderina Seidlitz, 1896									
Gonodera luperus luperus (Herbst, 1783)	H		X	N	N	X	X	B	
Gonodera metallica (Küster, 1850)	H		X	N	N	X	X		
Isomira genistae (Rottenberg, 1871) [E]					N	N			
Isomira icteropa (Küster, 1852)	X			N		X	X	N	
Isomira marcida Kiesenwetter, 1863	X	X	X			X	X		
Isomira melanophthalma (P.H. Lucas, 1846)	H	X			N			N	
Isomira murina murina (Linnaeus, 1758)				B		X	X	B	
Isomira ochropus (Küster, 1850)		N						N	
Isomira testacea Seidlitz, 1896	H	X	X	N	N	X	X	B	
Isomira umbellatarum (Kiesenwetter, 1863)				B					
Pseudocistela ceramboides ceramboides (Linnaeus, 1761)			X			X	X	N	NT
Mycetocharina Gistel, 1848									
Mycetochara axillaris axillaris (Paykull, 1799)	X								NT
Mycetochara maura (Fabricius, 1792)		X					B		LC
Mycetochara quadrimaculata (Latreille, 1804)		X							LC
Cteniopodini Solier, 1835									
Cteniopus neapolitanus Baudi di Selve, 1877 [E]		X			N	N			NT
Cteniopus sulphureus (Linnaeus, 1758)	X					X	X	B	LC
Cteniopus sulphuripes (Germar, 1824)	X								NT
Megischia curvipes curvipes (Brullé, 1832)	H			N	N	X	X	B	

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Megischina armillata (Brullé, 1832)					N	X	X	B	
Omophlus dispar A. Costa, 1847 [E]	X	X		N	N	X	X	B	
Omophlus flavipennis Küster, 1849	X					X			
Omophlus lepturoides (Fabricius, 1787)	X	X		N	N	X	N	B	
Omophlus longicornis Bertolini, 1868							X		
Omophlus picipes (Fabricius, 1792)				B		X	X	N	
Omophlus pubescens (Linnaeus, 1758)					N	X	X	B	
Omophlus rugosicollis (Brullé, 1832)					N				
Podonta italica Baudi di Selve, 1877 [E]	H	X	X	N	N	X			
Stenochiinae Kirby, 1837									
Cnodalonini Gistel, 1856									
Iphthiminus italicus italicus (Truqui, 1857)	X				B	X	X	B	VU
Menephilus cylindricus cylindricus (Herbst, 1784)					N	X	X	N	NT
PROSTOMIDAE C.G. Thomson, 1859									
Schawaller in Cat. Pal. Col. Vol. 5, 2008									
Prostomis mandibularis (Fabricius, 1801)						N			LC
OEDEMERIDAE Latreille, 1810									
Calopodinae A. Costa, 1852									
Švihla in Cat. Pal. Col., vol. 5, 2008									
Sparedrus orsinii A. Costa, 1852 [E]	B	X	X		N			N	LC
Oedemerinae Latreille, 1810									
Asclerini Semenov, 1894									
Ischnomera caerulea (Linnaeus, 1758)	H	X			N	X	X	B	LC
Ischnomera cinerascens cinerascens (Pandellé, 1867)				N	N	X	X		LC
Ischnomera cyanea (Fabricius, 1792)					N	N		N	LC
Ischnomera sanguinicollis (Fabricius, 1787)				B	N	X	X		LC
Ditylini Mulsant, 1858									
Chrysanthia viridissima (Linnaeus, 1758)				N	N	X	X	B	LC
Nacerdini Mulsant, 1858									
Anogcodes ruficollis (Fabricius, 1781)		X		N	N	X		N	LC
Anogcodes rufiventris (Scopoli, 1763)		X					X		LC
Nacerdes melanura Linnaeus, 1758	!	N							LC
Oedemerini Latreille, 1810									
Oedemera atrata W.L.E. Schmidt, 1846	X	X		B	N	X	X	B	
Oedemera barbara (Fabricius, 1792)	H	X			N	N	X	B	
Oedemera crassipes Ganglbauer, 1881	H	X		B	N	X	X	N	
Oedemera croceicollis Gyllenhal, 1827		X							
Oedemera femoralis femoralis A.G. Olivier, 1803					N	X		N	LC
Oedemera femorata (Scopoli, 1763)	B	X	N	B	B	X	X	B	
Oedemera flavipes (Fabricius, 1792)	H	X	X	B	B	X	X	B	
Oedemera lurida (Marsham, 1802)	X		X	B	B	X	X	B	
Oedemera melanopyga W.L.E. Schmidt, 1846 [E]	H				N	X	X	B	
Oedemera nobilis (Scopoli, 1763)	H	X	X	B	B	X	X	B	
Oedemera podagrariae podagrariae (Linnaeus, 1767)	H	X	X	N	N	X	X	B	
Oedemera pthysica (Scopoli, 1763)		X	X	B	N	X	X	B	
Oedemera simplex (Linnaeus, 1767)	H	X	X	N	B	X	X	B	
Stenostomini Mulsant, 1858									
Stenostoma rostratum septentrionale Švihla, 2005	X	X						B	NT

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
MELOIDAE Gyllenhal, 1810									
Meloinae Gyllenhal, 1810									
Cerocomini Leach, 1815									
Bologna in Cat. Pal. Col., vol. 5, 2008; Bologna et al., 2008									
Cerocoma schaefferi (Linnaeus, 1758)	B		X	B	B	X	X	B	
Epicautini Denier, 1935									
Epicauta rufidorsum (Goeze, 1777)	B				N		B	B	
Lyttini Solier, 1851									
Lydus trimaculatus italicus Kaszab, 1952 [E]	H	X		B	B	B		B	
Lytta vesicatoria vesicatoria (Linnaeus, 1758)	X	X	X	N	B	X	X	B	
Mylabrini Laporte, 1840									
Mylabris fabricii Sumakov, 1924	X	X		B	B	X	X	B	
Mylabris flexuosa A.G. Olivier, 1811						X	X		
Mylabris obsoleta Nowicki, 1872 [E]	B	B	X	B	B	B	B		
Mylabris quadripunctata quadripunctata (Linnaeus, 1767)	B				B	B	B	B	
Mylabris variabilis (Pallas, 1781)	H	X		B	B	X	X	B	
Meloini Gyllenhal, 1810									
Meloe apenninicus Bologna, 1988 [E]			B			B	B	B	
Meloe autumnalis autumnalis A.G. Olivier, 1797	B	X			N		B	B	
Meloe baudii Leoni, 1907	B						B		
Meloe brevicollis brevicollis Panzer, 1793	X			B		X	X	B	
Meloe cavensis L. Petagna, 1819								B	
Meloe cicatricosus Leach, 1815				B	B	B		B	
Meloe erythrocnemus Pallas, 1782	B						B	B	
Meloe ganglbaueri Apfelbeck, 1905	B							B	
Meloe mediterraneus G. Müller, 1925	X	N						B	
Meloe proscarabaeus proscarabaeus Linnaeus, 1758	B	X	X			B	B	B	
Meloe rugosus Marsham, 1802							X		
Meloe tuccius corrosus Brandt & Erichson, 1832 [E]		X					B	B	
Meloe violaceus Marsham, 1802	H				B		B		
Nemognathinae Laporte, 1840									
Nemognathini Laporte, 1840									
Sitaris muralis (Forster, 1771)	B							B	
Stenoria apicalis apicalis (Latreille, 1804)	B								
Zonitis flava Fabricius, 1775	H	X	X		B	X	X	N	
Zonitis immaculata (A.G. Olivier, 1789)	H	X		N	B	X	X	B	
Zonitis nana Ragusa, 1881						X			
MYCTERIDAE Blanchand, 1845									
Mycterinae Blanchard, 1845									
Löbl in Cat. Pal. Col., vol. 5, 2008									
Mycterus curculionoides (Fabricius, 1781)	B	X				N	X	N	
Mycterus tibialis Küster, 1850	X	X	X	B	N	X	X	N	
Mycterus umbellatarum (Fabricius, 1787)	X								
PYROCHROIDAE Latreille, 1807									
Pyrochroinae Latreille, 1807									
Pollock & Young in Cat. Pal. Col., vol. 5, 2008									
Pyrochroa coccinea (Linnaeus, 1760)		X	X	N	N	X	X	N	LC
Pyrochroa serraticornis kiesenwetteri Fairmaire, 1849							X		NT
Pyrochroa serraticornis serraticornis Scopoli, 1763)	X				N	X		N	LC

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
SALPINGIDAE Leach, 1815									
Agleninae Horn, 1878									
Pollock & Löbl in Cat. Pal. Col., vol. 5, 2008									
Aglenus brunneus (Gyllenhal, 1813)	X	X	X			X		N	LC
Salpinginae Leach, 1815									
Lissodema denticolle (Gyllenhal, 1813)		X	X					N	LC
Lissodema lituratum (A. Costa, 1847)						N			LC
Rabocerus foveolatus (Ljungh, 1823)							X	N	LC
Salpingus planirostris (Fabricius, 1787)	X	X	X	N	N	X	X	N	LC
Salpingus ruficollis (Linnaeus, 1760)	H				N	X		N	NT
Vincenzellus ruficollis (Panzer, 1794)					B	X	X	B	LC
ANTHICIDAE Latreille, 1819									
Anthicinae Latreille, 1819									
Chandler, Uhmann, Nardi & Telnov in Cat. Pal. Col., vol. 5, 2008									
Amblyderus scabricollis (LaFerté-Sénectère, 1847)							N		
Anthelephila pedestris (P. Rossi, 1790)	H	X	X	N	N	X	X	B	
Anthicus antherinus antherinus (Linnaeus, 1760)	H		X			X	X	N	
Anthicus biguttatus LaFerté-Sénectère, 1849								N	
Anthicus fenestratus W.L.E. Schmidt, 1842	X	X						N	
Anthicus invreai Koch, 1933	X	X	X						
Anthicus laeviceps Baudi di Selve, 1877	X	X	X	N	N	X	X	N	
Anthicus luteicornis W.L.E. Schmidt, 1842					N				
Anthicus niger (A.G. Olivier, 1811)	H	X	X	N	N	X	N	B	
Anthicus quadrioculatus LaFerté-Sénectère, 1849		N			B				
Anthicus tristis tristis W.L.E. Schmidt, 1842		X						N	
Clavicomus paganettii (Pic, 1909) [E]		X							
Cordicomus gracilior (Abeille de Perrin, 1885)		X							
Cordicomus instabilis instabilis (W.L.E. Schmidt, 1842)	H	X	X		N	N		B	
Cyclodinus blandulus blandulus (Baudi di Selve, 1877)								B	
Cyclodinus bremei bremei (LaFerté-Sénectère, 1842)		X							
Cyclodinus coniceps (Marseul, 1879)	X	X						N	
Cyclodinus constrictus constrictus (Curtis, 1838)	X					N		B	
Cyclodinus humilis (Germar, 1824)		N	X?					B	
Cyclodinus italicus (Pic, 1901) [E]	X	X							
Cyclodinus larvipennis (Marseul, 1879)		X							
Cyclodinus minutus minutus (LaFerté-Sénectère, 1842)	N								
Endomia occipitalis (Dufour, 1843)					N		X	B	
Endomia tenuicollis tenuicollis (P. Rossi, 1792)	H	X	X	N		X	N	N	
Endomia unifasciata unifasciata (Bonelli, 1812)		X	X		N				
Hirticomus hispidus (P. Rossi, 1792)	H	X	X	N	N	X	X	N	
Hirticomus quadriguttatus (P. Rossi, 1792)	X	X	X	N		X		B	
Leptaleus rodriguesi (Latreille, 1804)	N		X		B	B	B	N	
Microhoria fasciata fasciata (Chevrolat, 1834)	H	X				X	X	N	
Microhoria helenae (Koch, 1933) [E]	X								
Microhoria leonhardi (Krekich-Strassoldo, 1913) [E]	H								
Microhoria raveli (Pic, 1899)	X	X				X			
Microhoria terminata (W.L.E. Schmidt, 1842)	H	X	N	N		X	X	B	
Omonadus bifasciatus (P. Rossi, 1792)	X	X	X			X	X	B	
Omonadus floralis (Linnaeus, 1758)	H	X	X	N		X	X	N	
Omonadus formicarius formicarius (Goeze, 1777)			X					N	
Stricticomus longicollis (W.L.E. Schmidt, 1842)					B	B		B	
Stricticomus tobias (Marseul, 1879)		X				X			

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Stricticomus transversalis transversalis (A. Villa & G.B. Villa, 1833)	X	X			N	N		B	
Tenuicomus velox velox (LaFerté-Sénectère, 1849)								B	
Notoxinae Stephens, 1829									
Mecynotarsus serricornis (Panzer, 1796)	X	X							
Notoxus appendicinus Desbrochers des Loges, 1874	X	X						N	
Notoxus brachycerus (Faldermann, 1837)		X						B	
Notoxus lonai Bucciarelli, 1973 [E]		X					X		
Notoxus miles italicus Bucciarelli, 1978 [E]		X			N	X	X	N	
Notoxus trifasciatus P. Rossi, 1792		X		N		X	X	B	
Tomoderinae Bonadona, 1961									
Pseudotomoderus compressicollis compressicollis (Motschulsky, 1839)	X	X			B	N			
Tomoderus italicus Marseul, 1879 [E]				N	B	N	X	B	
ADERIDAE Csiki, 1909 Nardi in Cat. Pal. Col., vol. 5, 2008									
Aderus populneus (Creutzer, 1796)			X					B	LC
Anidorus nigrinus (Germar, 1842)					N		B		LC
Cobosia pruinosa pruinosa (Kiesenwetter, 1861)	H				N				
Gompelia ruficollis (P. Rossi, 1794)	X						X	B	NT
Phytobaenus amabilis amabilis R.F. Sahlberg, 1834	X	N	X			X	X	B	NT
SCRAPTIIDAE Gistel, 1848 **Scraptiinae** Gistel, 1848 **Scraptiini** Gistel, 1848 Leblanc, Levey & Horák in Cat. Pal. Col., vol. 5, 2008									
Scraptia bifoveolata Küster, 1853	X	X	X			X	X		
Scraptia dubia (A.G. Olivier, 1790)	H	X		N		X	X		
Scraptia ferruginea Kiesenwetter, 1861	H	X							
Scraptia ophthalmica Mulsant, 1856		X							VU
Trotomma pubescens Kiesenwetter, 1851	H	N		N	N	N		N	
Anaspidinae Mulsant, 1856 **Anaspidini** Mulsant, 1856									
Anaspis brunnipes (Mulsant, 1856)	H								
Anaspis costai Emery, 1876	X	X				X			VU
Anaspis fasciata (Forster, 1771)	X	X							
Anaspis flava (Linnaeus, 1758)	H			N		X	X	N	LC
Anaspis frontalis (Linnaeus, 1758)	H	X	N	N		X	X		LC
Anaspis labiata A. Costa, 1854		X	N						
Anaspis lurida Stephens, 1832	H	X				X	X	N	LC
Anaspis maculata (Geoffroy, 1785)	H	X		N	N	X	X	N	
Anaspis melanostoma A. Costa, 1854						X			
Anaspis nigripes C.N.F. Brisout de Barneville, 1866	H	X			N	X		N	
Anaspis palpalis (Gerhardt, 1876)	H	X			N		X	N	
Anaspis pulicaria A. Costa, 1854	H	X		N	N	X	X	N	LC
Anaspis quadrimaculata Gyllenhal, 1817	H								
Anaspis regimbarti Schilsky, 1895		N						N	
Anaspis ruficollis (Fabricius, 1792)	H	X?				X			EN
Anaspis rufilabris (Gyllenhal, 1827)	X						X		EN
Anaspis serbica Apfelbeck, 1931						X	X		
Anaspis thoracica (Linnaeus, 1758)							X		
Anaspis varians varians (Mulsant, 1856)	H	X				X	X		
Anaspis viennensis Schilsky, 1895						X			

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
CHRYSOMELOIDEA Latreille, 1802									
VESPERIDAE Mulsant, 1839									
Vesperinae Mulsant, 1839									
Vesperini Mulsant, 1839									
Sama & Löbl in Cat. Pal. Col., vol. 6, 2010; Bouchard et al., 2011									
Vesperus luridus (P. Rossi, 1794)	X	B	X		CK	N	X	B	
CERAMBYCIDAE Latreille, 1802									
Sama & Löbl in Cat. Pal. Col., vol. 6, 2010 (except Prioninae and Dorcadionini)									
Prioninae Latreille, 1802									
Aegosomatini J. Thomson, 1861									
Drumont & Komiya in Cat. Pal. Col., vol. 6, 2010									
Aegosoma scabricorne (Scopoli, 1763)	X	X			N	CK	B		LC
Ergatini Fairmaire, 1864									
Ergates faber faber (Linnaeus, 1751)	X					!			LC
Ergates faber opifex Mulsant, 1851							X	B	NT
Macrotomini J. Thomson, 1861									
Prinobius myardi slamorum Danilevsky, 2012	B	X			B				NT
Prionini Latreille, 1802									
Prionus coriarius (Linnaeus, 1758)	X			B	N	X	X	B	NT
Lepturinae Latreille, 1802									
Lepturini Latreille, 1802									
Alosterna tabacicolor tabacicolor (DeGeer, 1775)	X				CK	CK	B	N	LC
Anastrangalia dubia dubia (Scopoli, 1763)				N		X	B	B	LC
Anastrangalia sanguinolenta (Linnaeus, 1760)				N	N	X	X	CK	LC
Anoplodera rufipes izzilloi Sama, 1999 [E]				B	B	CK			NT
Anoplodera sexguttata (Fabricius, 1775)					B				LC
Grammoptera ruficornis ruficornis (Fabricius, 1781)	B			CK	CK	X	X	N	LC
Grammoptera ustulata ustulata (Schaller, 1783)	CK			B		X	X	N	NT
Leptura aurulenta Fabricius, 1793						X	X		LC
Pachytodes erraticus (Dalman, 1817)	X			B	CK	X	X		LC
Pedostrangalia revestita (Linnaeus, 1767)	B	B			CK	B			NT
Pseudovadonia livida pecta K. Daniel & J. Daniel, 1891	H	X		N	B	X	X	CK	LC
Rutpela maculata maculata (Poda von Neuhaus, 1761)	X	X	X	N	CK	X	X	N	LC
Stenurella bifasciata bifasciata (O.F. Müller, 1776)	H	X	X	B	B	X	X	N	LC
Stenurella melanura melanura (Linnaeus, 1758)	X	X			N	X	X	N	LC
Stenurella nigra nigra (Linnaeus, 1758)	X	X		B	B	X	X	B	LC
Stictoleptura cordigera cordigera (Fuessly, 1775)	H	X	X	B	B	X	X	B	LC
Stictoleptura fulva (DeGeer, 1775)	CK			B	B	X	X	N	
Stictoleptura rubra rubra (Linnaeus, 1758)						X			LC
Stictoleptura rufa rufa (Brullé, 1832)	B	X			B	CK	B	B	NT
Stictoleptura scutellata scutellata (Fabricius, 1781)	X	X		B	CK	X	X	B	NT
Rhagiini Kirby, 1837									
Acmaeops marginatus (Fabricius, 1781)						B			NT
Cortodera humeralis aspromontana G. Müller, 1948	B			B	B	X		B	NT
Dinoptera collaris (Linnaeus, 1758)	H		N	N	B	X	X	N	LC
Evodinellus clathratus (Fabricius, 1792)	X								NT
Pidonia lurida (Fabricius, 1793)	X					X			NT
Rhagium bifasciatum Fabricius, 1775					N	CK	X		LC
Rhagium inquisitor inquisitor (Linnaeus, 1758)				N		X	X	CK	LC
Rhagium mordax (DeGeer, 1775)					N	X	X	B	LC
Rhagium sycophanta (Schrank, 1781)				B	N	X			NT

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Stenocorus meridianus (Linnaeus, 1758)					CK	X	X	B	NT
Stenocorus quercus quercus (Götz, 1783)				B					
Rhamnusiini Danilevsky in Althoff & Danilevsky, 1997									
Rhamnusium bicolor italicum G. Müller, 1966 [E]				B	B	X			CR
Necydalinae Latreille, 1825									
Necydalis ulmi (Chevrolat, 1838)		CK				CK			NT
Spondylidinae Audinet-Serville, 1832									
Asemini J. Thomson, 1861									
Arhopalus ferus Mulsant, 1839	X	B				X	X	B	LC
Arhopalus rusticus rusticus (Linnaeus, 1758)				N		X	X	B	LC
Arhopalus syriacus (Reitter, 1895)	CK						B	CK	LC
Asemum striatum striatum (Linnaeus, 1758)						X	X		LC
Nothorhina punctata (Fabricius, 1798)							B		NT
Saphanini Gistel, 1848									
Saphanus piceus piceus (Laicharting, 1784)						CK	B		NT
Spondylidini Audinet-Serville, 1832									
Spondylis buprestoides (Linnaeus, 1758)	X					B	X	CK	NT
Cerambycinae Latreille, 1802									
Achrysonini Lacordaire, 1868									
Icosium tomentosum atticum Ganglbauer, 1881	CK	B							LC
Anaglyptini Lacordaire, 1868									
Anaglyptus gibbosus (Fabricius, 1787)	H	X		B	CK	X	X	CK	LC
Anaglyptus mysticus (Linnaeus, 1758)		X		B		X	X	CK	LC
Anaglyptus zappii Rapuzzi & Sama, 2014 [E]					B	B			VU
Brachypteromatini Sama, 2008									
Dolocerus reichii Mulsant, 1862	H			B	CK	X		N	LC
Callichromatini Swainson & Shuckard, 1840									
Aromia moschata moschata (Linnaeus, 1758)		X		B		X	X	N	LC
Callidiini Kirby, 1837									
Callidium aeneum aeneum DeGeer, 1775						X	X	CK	LC
Leioderes kollari kollari L. Redtenbacher, 1849	B								NT
Phymatodes alni alni (Linnaeus, 1767)	X	N		B	N	X	X	N	LC
Phymatodes fasciatus (Villers, 1789)	CK								LC
Phymatodes glabratus (Charpentier, 1825)		B							NT
Phymatodes lividus (P. Rossi, 1794)	X								LC
Phymatodes pusillus pusillus (Fabricius, 1787)	CK				N				NT
Phymatodes rufipes rufipes (Fabricius, 1777)				B	B		X		NT
Phymatodes testaceus (Linnaeus, 1758)	H	X	X	N	B	X	X	CK	LC
Pyrrhidium sanguineum (Linnaeus, 1758)					B	X			LC
Ropalopus clavipes (Fabricius, 1775)	X	X			N	X	B		LC
Ropalopus ungaricus (Herbst, 1784)	B				B				NT
Ropalopus varini (Bedel, 1870)					B				NT
Semanotus russicus russicus (Fabricius, 1777)	B				!				NT
Cerambycini Latreille, 1802									
Cerambyx cerdo cerdo Linnaeus, 1758	X	X			B	X	B	B	LC
Cerambyx miles Bonelli, 1812					B	B			LC
Cerambyx scopolii scopolii Fuessly, 1775	H	X		N	B	X	X	B	LC
Cerambyx welensii welensii (Küster, 1845)	X	X			B	X	B	B	LC
Certallini Fairmaire, 1864									
Certallum ebulinum (Linnaeus, 1767)	CK							B	
Clytini Mulsant, 1839									

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Chlorophorus figuratus (Scopoli, 1763)	H			N	CK	X	X	N	LC
Chlorophorus glabromaculatus glabromaculatus (Goeze, 1777)	B	X			CK				LC
Chlorophorus sartor (O.F. Müller, 1766)	H	X	X	N	B	X	X	CK	LC
Chlorophorus trifasciatus (Fabricius, 1781)	H				B	X		B	LC
Chlorophorus varius (O.F. Müller, 1766)	X	X	X			CK	X	N	LC
Clytus arietis (Linnaeus, 1758)	X	X		B	B	X	X	B	LC
Clytus rhamni bellieri Gautier des Cottes, 1862	H	X		N	B	X	X	N	LC
Clytus triangulimacula A. Costa, 1854 [E]	H				N	CK	N		VU
Echinocerus floralis (Pallas, 1773)	X	X	X	N	B	B	X	B	
Isotomus speciosus barbarae Sama, 1977 [E]					B				NT
Neoplagionotus scalaris (Brullé, 1832)	H	X		B		X	X		
Plagionotus arcuatus arcuatus (Linnaeus, 1758)	B			B	N	X	X		LC
Plagionotus detritus detritus (Linnaeus, 1758)					B	CK		B	NT
Pseudosphegesthes cinerea (Laporte & Gory, 1841)					B				NT
Rusticoclytus rusticus (Linnaeus, 1758)					CK		X		
Xylotrechus antilope antilope (Schönherr, 1817)	B			N		B			LC
Xylotrechus arvicola arvicola (A.G. Olivier, 1795)	B	X			B	X	X	B	LC
Deilini Fairmaire, 1864									
Deilus fugax (A.G. Olivier, 1790)	X	X		N	B	X	X	N	LC
Graciliini Mulsant, 1839									
Axinopalpis gracilis gracilis (Krynicky, 1832)	X					X			NT
Gracilia minuta (Fabricius, 1781)	X	X		N		X	X	N	LC
Penichroa fasciata (Stephens, 1831)	B	N						B	LC
Hesperophanini Mulsant, 1839 **Hesperophanina** Mulsant, 1839									
Hesperophanes sericeus (Fabricius, 1787)	CK	B						B	LC
Stromatium unicolor (A.G. Olivier, 1795)		CK				X		B	LC
Trichoferus fasciculatus fasciculatus (Faldermann, 1837)	B	B	X		B	B			LC
Trichoferus griseus (Fabricius, 1793)	X	X		N	B	X	B	B	LC
Trichoferus holosericeus (P. Rossi, 1790)	B				CK	X			LC
Trichoferus spartii (G. Müller, 1948)	CK	B			CK	CK			
Hylotrupini Zagajkevitch, 1991									
Hylotrupes bajulus (Linnaeus, 1758)	X	X			N	X	X	B	LC
Molorchini Gistel, 1848									
Molorchus minor minor (Linnaeus, 1758)				N	CK	B	X		LC
Molorchus umbellatarus umbellatarus (Schreber, 1759)	CK			B	N	X	X	N	LC
Nathriini Arnett, 1962									
Nathrius brevipennis (Mulsant, 1839)	B	X							LC
Obriini Mulsant, 1839									
Obrium brunneum (Fabricius, 1793)				N		B	X		LC
Obrium cantharinum cantharinum (Linnaeus, 1767)		X							NT
Phoracanthini Newman, 1840									
Phoracantha recurva Newman, 1840								B	NA
Phoracantha semipunctata (Fabricius, 1775)		X							NA
Purpuricenini J. Thomson, 1861									
Purpuricenus coccineus Breit, 1917								B	NT
Purpuricenus globulicollis globulicollis Dejean, 1839		CK				CK	X		NT
Purpuricenus kaehleri kaehleri (Linnaeus, 1758)	H	X		N	B	X		B	LC
Rosaliini Fairmaire, 1864									
Rosalia alpina alpina (Linnaeus, 1758)	B	X			N	X	X	N	NT
Stenhomalini Miroshnikov, 1989									
Stenhomalus bicolor (Kraatz, 1862)	H			B					NT

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Stenopterini Gistel, 1848									
Callimus abdominalis (A.G. Olivier, 1795)	X	N			CK	N			LC
Callimus angulatus angulatus (Schrank, 1789)				B	N	N	X		LC
Stenopterus ater (Linnaeus, 1767)	H	X	X	B	B	X	X	CK	LC
Stenopterus flavicornis Küster, 1846						X	X		NT
Stenopterus rufus rufus (Linnaeus, 1767)	H	X	X	N	B	X	X	CK	LC
Lamiinae Latreille, 1825									
Acanthocinini Blanchard, 1845									
Acanthocinus aedilis (Linnaeus, 1758)						X	X	N	LC
Acanthocinus griseus (Fabricius, 1793)	B						X	N	LC
Acanthocinus reticulatus (Razoumov, 1789)						X			LC
Acanthocinus xanthoneurus (Mulsant & Rey, 1852) [E]					!	B	X	B	NT
Leiopus femoratus Fairmaire, 1859								B	NT
Leiopus nebulosus nebulosus (Linnaeus, 1758)	X	N		N	N	X	X	B	LC
Acanthoderini J. Thomson, 1860									
Aegomorphus clavipes (Schrank, 1781)	X	X			N	X	X	N	LC
Agapanthiini Mulsant, 1839									
Agapanthia asphodeli (Latreille, 1804)	B			B		CK			
Agapanthia cardui (Linnaeus, 1767)	H	X	X	B	B	X	X	B	
Agapanthia cynarae cynarae (Gyllenhal, 1817)	X	X		N	B	X	X		
Agapanthia irrorata (Fabricius, 1787)	CK				!		X		
Agapanthia maculicornis davidi Sláma, 1986 [E]		B		CK	CK	B			
Agapanthia sicula malmerendii Sama, 1981	H	X	CK	B	B	CK		CK	
Agapanthia suturalis (Fabricius, 1787)				B				B	
Agapanthia villosoviridescens (DeGeer, 1775)		X		N	B	X	X		
Agapanthia violacea (Fabricius, 1775)	X			B	B	X	X	N	
Calamobius filum (P. Rossi, 1790)	H	X	X	B	N	X	X	N	
Apodasyini Lacordaire, 1872									
Anaesthetis testacea testacea (Fabricius, 1781)	X	X			CK	X	X	B	LC
Deroplia genei genei (Aragona, 1830)		X							NT
Deroplia troberti troberti (Mulsant, 1843)	B								NT
Dorcadionini Swainson & Shuckard, 1840 Danilevsky in Cat. Pal. Col., vol. 6, 2010									
Dorcadion arenarium marsicanum D'Amore Fracassi, 1905	H	B							
Dorcadion etruscum etruscum (P. Rossi, 1790) [E]	H	X	X	B	B	X	X	CK	
Neodorcadion calabricum (Reitter, 1889) [E]								B	
Lamiini Latreille, 1825									
Herophila tristis martinascoi (Contarini & Gargagni, 1983)		X						CK	NT
Herophila tristis tristis (Linnaeus, 1767)	H			CK	B	X	X		LC
Lamia textor (Linnaeus, 1758)		X			!			B	NT
Morimus asper asper (Sulzer, 1776)	H	X		N	CK	X	X	B	LC
Mesosini Mulsant, 1839									
Mesosa curculionoides (Linnaeus, 1760)	X	X	X		B	B		B	LC
Mesosa nebulosa nebulosa (Fabricius, 1781)	B	X		B	CK		B		LC
Monochamini Gistel, 1848									
Monochamus galloprovincialis galloprovincialis (A.G. Olivier, 1795)	B								LC
Parmenini Mulsant, 1839									
Parmena pubescens (Dalman, 1817)	X							B	LC
Parmena subpubescens Hellrigl, 1971 [E]								CK	NT
Parmena unifasciata (P. Rossi, 1790)	H	X		B	N				LC
Phytoeciini Mulsant, 1839									

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Oberea linearis (Linnaeus, 1760)		B			B		X		LC
Oberea oculata (Linnaeus, 1758)		B				X			LC
Phytoecia affinis nigrohirta (G. Müller, 1948) [E]				B					
Phytoecia caerulea caerulea (Scopoli, 1772)	H	X	X	B		X	X	B	
Phytoecia coerulescens coerulescens (Scopoli, 1763)	H	CK		B	N	X	X	N	
Phytoecia cylindrica (Linnaeus, 1758)	X	B	X	B	B	B	B	CK	
Phytoecia nigricornis (Fabricius, 1782)					N		X		
Phytoecia pustulata pustulata (Schrank, 1776)	X		X	CK	N	B	X	N	
Phytoecia rufipes rufipes (A.G. Olivier, 1795)	H		X			CK	CK		
Phytoecia virgula virgula (Charpentier, 1825)	H	X	X	N	B	B	X		
Phytoecia vulneris eremita Sama, 1999 [E]						CK			
Phytoecia vulneris vulneris Aurivillius, 1923	H	X		B	B		CK	N	
Pogonocherini Mulsant, 1839									
Exocentrus adspersus Mulsant, 1846	B		X		CK		B		LC
Exocentrus lusitanicus (Linnaeus, 1767)					B				NT
Exocentrus punctipennis punctipennis Mulsant & Guillebeau, 1856	B	X			CK				LC
Pogonocherus decoratus Fairmaire, 1855						CK	X		NT
Pogonocherus eugeniae eugeniae Ganglbauer, 1891						X		B	NT
Pogonocherus fasciculatus fasciculatus (DeGeer, 1775)					N	B			LC
Pogonocherus hispidulus (Piller & Mitterpacher, 1783)		B						CK	LC
Pogonocherus hispidus (Linnaeus, 1758)	H	B	X	B		B	X		LC
Pogonocherus neuhausi (G. Müller, 1916)	X	N							NT
Pogonocherus ovatoides Rapuzzi & Sama, 2014						B		B	NT
Pogonocherus perroudi perroudi Mulsant, 1839	X						X		LC
Pteropliini J. Thomson, 1860									
Niphona picticornis Mulsant, 1839	H	X							LC
Saperdini Mulsant, 1839									
Saperda carcharias (Linnaeus, 1758)		B	X					B	NT
Saperda octopunctata (Scopoli, 1772)							X		NT
Saperda populnea populnea (Linnaeus, 1758)		X				B	X		
Saperda punctata (Linnaeus, 1767)		X		B	B	N		N	LC
Saperda scalaris scalaris (Linnaeus, 1758)					!	B	X		LC
Saperda similis Laicharting, 1784							X		NT
Stenostola ferrea ferrea (Schrank, 1776)					CK		X		NT
Tetropini Portevin, 1927									
Tetrops praeustus praeustus (Linnaeus, 1758)	H	X	X	N	N	X	N		LC
Tetrops starkii starkii Chevrolat, 1859					B				NT
MEGALOPODIDAE Latreille, 1802 **Zeugophorinae** Böving & Craighead, 1931 Silfverberg in Cat. Pal. Col., vol. 6, 2010									
Zeugophora subspinosa (Fabricius, 1781)						N			
ORSODACNIDAE C.G. Thomson, 1859 Silfverberg in Cat. Pal. Col., vol. 6, 2010									
Orsodacne humeralis humeralis Latreille, 1804	N		N	B	N	N	N	N	
CHRYSOMELIDAE Latreille, 1802									
Bruchinae Latreille, 1802 **Amblycerini** Bridwell, 1932 **Spermophagina** Borowiec, 1987 Anton in Cat. Pal. Col., vol. 6, 2010									
Spermophagus calystegiae (Lukjanovitch & Ter-Minassian, 1957)			X		B			N	

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Spermophagus kuesteri Schilsky, 1905			X					N	
Spermophagus sericeus (Geoffroy, 1785)	H	X	X		N	X	X	N	
Bruchini Latreille, 1802 **Acanthoscelidina** Bridwell, 1946									
Acanthoscelides obtectus (Say, 1831)	X	X			B				
Acanthoscelides pallidipennis (Motschulsky, 1874)			X		N				
Bruchidius biguttatus (A.G. Olivier, 1795)	B						X	N	
Bruchidius bimaculatus (A.G. Olivier, 1795)	H	X	X		N	N		N	
Bruchidius calabrensis (Blanchard, 1844)		X			N			N	
Bruchidius caninus (Kraatz, 1869)	B		X		B	X	X		
Bruchidius cinerascens (Gyllenhal, 1833)		N	X		N	N			
Bruchidius cisti (Fabricius, 1775)	H		X		B	X	X	N	
Bruchidius corsicus (Baudi di Selve, 1890)	H		X				X		
Bruchidius dispar (Gyllenhal, 1833)	H		X		N	N	X	N	
Bruchidius foveolatus (Gyllenhal, 1833)	H	X	X	N	N	X	X	N	
Bruchidius jocosus (Gyllenhal, 1833)							X		
Bruchidius lineatus (Allard, 1868)					B	N	B	B	
Bruchidius lividimanus (Gyllenhal, 1833)	H	X	X		N	N	X	N	
Bruchidius lutescens (Blanchard, 1844)	B					B			
Bruchidius marginalis (Fabricius, 1776)	H		X	N		X		N	
Bruchidius martinezi (Allard, 1868)			X						
Bruchidius meleagrinus (Gené, 1839)	H	X	X	N	N	X	X	N	
Bruchidius mulsanti (C.N.F. Brisout de Barneville, 1863)	H	X	X		N				
Bruchidius murinus (Boheman, 1829)	H	X	X	N	B	X	X	N	
Bruchidius nanus (Germar, 1824)	H	X	X	B	N	X	X	N	
Bruchidius nudus (Allard, 1868)	H		X		N		X	N	
Bruchidius obscuripes (Gyllenhal, 1839)	N								
Bruchidius olivaceus (Germar, 1824)		X			B	B		N	
Bruchidius picipes (Germar, 1824)	B		N		N	X	X	N	
Bruchidius poecilus (Germar, 1824)	H		X		B	B			
Bruchidius poupillieri (Allard, 1868)		N	X			B			
Bruchidius pygmaeus (Boheman, 1833)	H		X	N	N	X	X	N	
Bruchidius seminarius (Linnaeus, 1767)	H	X	X	N	N	X	X	N	
Bruchidius sericatus (Germar, 1824)	H	X	X	N	N	X	X	N	
Bruchidius tibialis (Boheman, 1829)	H	N	X		N	N			
Bruchidius tuberculatus (Hochhuth, 1847)	H								
Bruchidius unicolor (A.G. Olivier, 1795)						N			
Bruchidius varipictus (Motschulsky, 1874)			X		N				
Bruchidius varius (A.G. Olivier, 1795)	H		X		N	N	X	N	
Bruchidius villosus (Fabricius, 1792)	X				N	B	X	B	
Callosobruchus maculatus (Fabricius, 1775)	B	X							
Paleoacanthoscelides gilvus (Gyllenhal, 1839)	X	X	X	N	N	X	X	N	
Bruchina Latreille, 1802									
Bruchus affinis J.A. Frölich, 1799		X							
Bruchus atomarius (Linnaeus, 1760)				N	N	B	X		
Bruchus brachialis Fåhraeus, 1839	H	X		N	N	X	X	N	
Bruchus emarginatus Allard, 1868			X						
Bruchus ervi J.A. Frölich, 1799								N	
Bruchus griseomaculatus Gyllenhal, 1833			X		N				
Bruchus laticollis Boheman, 1833	H	X	X		N	B		N	
Bruchus lentis J.A. Frölich, 1799						B			
Bruchus loti Paykull, 1800	H		X		N	X	X	N	
Bruchus luteicornis Illiger, 1794	H	X	X		N		N	N	

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Bruchus pisorum (Linnaeus, 1758)	H	X			N	B			
Bruchus rufimanus Boheman, 1833	H	X	X		B	X			
Bruchus rufipes Herbst, 1783	H	X	X	N	N	X	X	N	
Bruchus signaticornis Gyllenhal, 1833	H	X					X		
Bruchus tristiculus Fåhraeus, 1839	H	X	X		N				
Bruchus ulicis Mulsant & Rey, 1858					N				
Bruchus viciae A.G. Olivier, 1795	H		X		N	N	X	N	
Donaciinae Kirby, 1837 **Donaciini** Kirby, 1837 Silfverberg in Cat. Pal. Col., vol. 6, 2010									
Donacia bicolora meridionalis Weise, 1886 [E]		N							
Donacia cinerea Herbst, 1784	N	X				N			
Donacia impressa Paykull, 1799		X							
Donacia reticulata Gyllenhal, 1817		X		B			X		
Donacia simplex Fabricius, 1775	X	X	X			X			
Donacia versicolorea (Brahm, 1790)				B					
Donacia vulgaris vulgaris Zschach, 1788				N					
Plateumarini Baving, 1922									
Plateumaris sericea sericea (Linnaeus, 1760)							X		
Criocerinae Latreille, 1804 Schmitt in Cat. Pal. Col., vol. 6, 2010									
Crioceris duodecimpunctata (Linnaeus, 1758)	H	X				X	X	B	
Crioceris macilenta Weise, 1881	X	X				X			
Crioceris paracenthesis (Linnaeus, 1767)	H	X		N		X	X	B	
Lema cyanella (Linnaeus, 1758)		X	N						
Lilioceris lilii (Scopoli, 1763)				N		X			
Lilioceris merdigera (Linnaeus, 1758)				B				B	
Lilioceris stercoraria (Linnaeus, 1767)								B	
Oulema erichsonii Suffrian, 1841				B					
Oulema magistrettiorum Ruffo, 1964 [E]					N				
Oulema melanopus (Linnaeus, 1758)	H	X	X	N	N	X	X	B	
Oulema rufocyanea (Suffrian, 1847)				B					
Cassidinae Gyllenhal, 1813 **Cassidini** Gyllenhal, 1813 Borowiec & Sekerka in Cat. Pal. Col., vol. 6, 2010									
Cassida algirica P.H. Lucas, 1849	X	X			!	B		B	
Cassida deflorata Suffrian, 1844	B			B	!	B			
Cassida denticollis Suffrian, 1844			X		!	B	X	N	
Cassida ferruginea Goeze, 1777			!				B		
Cassida flaveola Thunberg, 1794							B		
Cassida hemisphaerica Herbst, 1799	B								
Cassida hexastigma Suffrian, 1844	B					B			
Cassida inopinata Sassi & Borowiec, 2006	B	B	B			B			
Cassida inquinata Brullé, 1832	B	X	X			N			
Cassida margaritacea Schaller, 1783	H	X	!	B	N	N	X	B	
Cassida nebulosa Linnaeus, 1758					N				
Cassida nobilis Linnaeus, 1758		N							
Cassida prasina Illiger, 1798	B	X				X	X		
Cassida pusilla Waltl, 1835		X			!				
Cassida rubiginosa rubiginosa O.F. Müller, 1776	H	X	X	N	B	B	X	B	
Cassida sanguinolenta O.F. Müller, 1776				!		B	X		
Cassida seladonia Gyllenhal, 1827						B			

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Cassida vibex Linnaeus, 1767		X	X		B	X			
Cassida viridis Linnaeus, 1758	H	X	X	B	N	B	X	B	
Cassida vittata Villers, 1789	B	X			N				
Hypocassida subferruginea (Schrank, 1776)	H	X	X	N		X		N	
Hispini Gyllenhal, 1813									
Dicladispa testacea (Linnaeus, 1767)	X	X			N	N	X	N	
Hispa atra Linnaeus, 1767	H	X	X		N	N	X	N	
Leptispini Fairmaire, 1864									
Lepthispa filiformis (Germar, 1842)	X								
Chrysomelinae Latreille, 1802 **Chrysomelini** Latreille, 1802 **Chrysomelina** Latreille, 1802 Kippenberg in Cat. Pal. Col., vol. 6, 2010									
Chrysomela populi Linnaeus, 1758	X	X	X	N	N	X	X	N	
Plagiodera versicolora (Laicharting, 1781)	X	X	X	N	N	X	X	N	
Plagiosterna aenea aenea (Linnaeus, 1758)					N	N	X	B	
Gastrophysina Kippenberg, 2010									
Gastrophysa polygoni polygoni (Linnaeus, 1758)	H	X			N	X	X	B	
Phratorina Motschulsky, 1860									
Phratora laticollis (Suffrian, 1851)	X	X	X	N	N	X	X		
Phratora vitellinae (Linnaeus, 1758)	X		X	N		X		B	
Prasocurina Reitter, 1913									
Phaedon armoraciae (Linnaeus, 1758)					N	B	X	B	
Phaedon cochleariae cochleariae (Fabricius, 1792)	H	X	X	N	N	X	X	N	
Phaedon laevigatus laevigatus (Duftschmid, 1825)	N					N		B	
Prasocuris flavocincta (Brullé, 1832)					N				
Prasocuris glabra (Herbst, 1783)					N		X		
Prasocuris junci (Brahm, 1790)	X								
Prasocuris vicina (P.H. Lucas, 1849)		X							
Doryphorini Motschulsky, 1860 **Chrysolinina** S.-H. Chen, 1936									
Chrysolina affinis bruttiana Bourdonné, 1999 [E]								B	
Chrysolina americana (Linnaeus, 1758)	H	X			N			B	
Chrysolina bankii (Fabricius, 1775)	H	X			N			!	
Chrysolina cerealis mixta (Küster, 1844)						B		B	
Chrysolina chalcites (Germar, 1824)	H								
Chrysolina corcyria (Suffrian, 1851)	H							!	
Chrysolina cribrosa sirentensis (Meier, 1900) [E]	X				B	X			
Chrysolina fastuosa fastuosa (Scopoli, 1763)	X				N	X	X	N	
Chrysolina grossa grossa (Fabricius, 1792)	H					X	X	N	
Chrysolina haemoptera corvina (Weise, 1916) [E]	X	X				B	X	B	
Chrysolina herbacea herbacea (Duftschmid, 1825)	X	X	X	B	N	N	X	!	
Chrysolina hyperici hyperici (Forster, 1771)	X	X	X	N		X	X	!	
Chrysolina interstincta interstincta (Suffrian, 1851) [E]	H					N	N	B	
Chrysolina lutea (L. Petagna, 1819)	H	X			N	X	X	B	
Chrysolina oricalcia (O.F. Müller, 1776)	X	X		N					
Chrysolina peregrina (Herrich-Schäffer, 1838)								B	
Chrysolina polita polita (Linnaeus, 1758)	X	X	X	B	N	!	X	B	
Chrysolina pseudolurida obscurefacta Bechyné, 1952 [E]	X					X			
Chrysolina rossia (Illiger, 1802)	H	X			N	X	X	B	
Chrysolina vernalis italica (Weise, 1882)	H	X	N		N	X	X	B	
Chrysolina viridana viridana (Küster, 1844)		X		B				N	

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Oreina alpestris marsicana (Luigioni, 1933) [E]						X			
Oreina cacaliae magistrettii (Schatzmayr, 1941) [E]						X			
Doryphorina Motschulsky, 1860									
Leptinotarsa decemlineata (Say, 1824)	X	X				N	X	N	
Entomoscelini Reitter, 1913									
Sclerophaedon orbicularis (Suffrian, 1851)		X				X	X		
Gonioctenini Motschulsky, 1860									
Gonioctena quinquepunctata quinquepunctata (Fabricius, 1787)						B			
Timarchini Motschulsky, 1860 Gomez-Zurita & Kippenberg in Cat. Pal. Col., vol. 6, 2010									
Timarcha metallica (Laicharting, 1781)							X		
Timarcha nicaeensis A. Villa & G.B. Villa, 1835	H	X			N	X	X	B	
Timarcha pimelioides Herrich-Schäffer, 1838 [E]		X	X	N	N	X		N	
Galerucinae Latreille, 1802 **Galerucini** Latreille, 1802 Beenen in Cat. Pal. Col., vol. 6, 2010									
Diorhabda elongata (Brullé, 1836)	H	X							
Galeruca interrupta (Illiger, 1802)	X						X		
Galeruca littoralis (Fabricius, 1787)	X				N				
Galeruca pomonae pomonae (Scopoli, 1763)	X		X				X		
Galeruca reichei (Joannis, 1865)	H								
Galeruca rufa Germar, 1824	H	X							
Galeruca tanaceti tanaceti (Linnaeus, 1758)	X	X		N	N	X	X	N	
Galerucella calmariensis (Linnaeus, 1767)			X		N				
Galerucella lineola lineola (Fabricius, 1781)	X		X	B					
Galerucella lineola solarii Burlini, 1942 [E]						X	X	N	
Lochmaea caprea (Linnaeus, 1758)						X			
Lochmaea crataegi (Forster, 1771)	H	X		N	N	N	X	N	
Xanthogaleruca luteola (O.F. Müller, 1766)	H	X			N	X			
Hylaspini Chapuis, 1875									
Agelastica alni alni (Linnaeus, 1758)						N	X	N	
Sermylassa halensis (Linnaeus, 1767)			X		N				
Luperini Gistel, 1848 **Luperina** Gistel, 1848									
Calomicrus circumfusus (Marsham, 1802)	X								
Calomicrus rottenbergi Ragusa, 1873 [E]					N	N	N		
Exosoma lusitanicum (Linnaeus, 1767)	H	X	X	N	N	X	X	N	
Luperus biraghii Ragusa, 1871 [E]	H			N	N	X	X	N	
Luperus calabricus Laboissiére, 1912 [E]	H				N				
Luperus leonardii Fogato, 1979 [E]	X			B	N	X	X	N	
Luperus longicornis (Fabricius, 1781)				N	N	N			
Luperus pygmaeus Joannis, 1865 [E]	H		X		N		B		
Luperus ragusai Laboissiére, 1919 [E]			X				N	N	
Alticinae Newman, 1835 Doberl in Cat. Pal. Col., vol. 6, 2010									
Altica aenescens (Weise, 1888)					B	B			
Altica ampelophaga (Guérin-Méneville, 1858)			N				X		
Altica brevicollis Foudras, 1861	H							B	
Altica carduorum Guérin-Méneville, 1858	X	X				N			
Altica lythri Aubé, 1843			N		N				
Altica oleracea (Linnaeus, 1758)	H	X	N	B	N	X	X	B	
Altica quercetorum Foudras, 1861	X								

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Altica tamaricis Schrank, 1785			N		N	N			
Aphthona carbonaria Rosenhauer, 1856		X	N			X		N	
Aphthona euphorbiae (Schrank, 1781)	B	X	X	N	N	X	CK	B	
Aphthona flaviceps Allard, 1859	H		X		N	N			
Aphthona herbigrada (Curtis, 1837)	B					CK	X		
Aphthona lutescens (Gyllenhal, 1813)		X	N			N			
Aphthona nigriceps (W. Redtenbacher, 1842)	H	X	X	N	N	X		B	
Aphthona nonstriata (Goeze, 1777)	X	X							
Aphthona pygmaea (Kutschera, 1861)	H	X			N	N		B	
Aphthona semicyanea Allard, 1859	H	N							
Aphthona sicelidis Weise, 1888			X					B	
Aphthona venustula Kutschera, 1861	H	X		N	N	X	X	B	
Apteropeda orbiculata (Marsham, 1802)	B					B	B	B	
Argopus ahrensii (Germar, 1817)						X			
Arrhenocoela lineata (P. Rossi, 1790)	X								
Batophila aerata (Marsham, 1802)	H	X	N	CK	CK	N			
Chaetocnema arenacea (Allard, 1860)				B			X		
Chaetocnema arida Foudras, 1860		X					X	N	
Chaetocnema aridula (Gyllenhal, 1827)		X							
Chaetocnema chlorophana (Duftschmid, 1825)		X	X		CK	N		B	
Chaetocnema concinna (Marsham, 1802)			CK	N	N		X	B	
Chaetocnema conducta (Motschulsky, 1838)	H	X	X		N			N	
Chaetocnema depressa (Boieldieu, 1859)							X		
Chaetocnema hortensis (Geoffroy, 1785)	X	X	X	N	N	X	X	N	
Chaetocnema mannerheimii (Gyllenhal, 1827)		N							
Chaetocnema montenegrina Heikertinger, 1912							X		
Chaetocnema obesa (Boieldieu, 1859)		X							
Chaetocnema picipes Stephens, 1831					N	CK		N	
Chaetocnema procerula (Rosenhauer, 1856)			X					B	
Chaetocnema punctifrons Abeille de Perrin, 1907		X	X					B	
Chaetocnema scheffleri (Kutschera, 1864)		X	B	!					
Chaetocnema semicoerulea (Koch, 1803)					N		N	CK	
Chaetocnema subcoerulea (Kutschera, 1864)			X						
Chaetocnema tibialis (Illiger, 1807)	H	X	B	N	N	X	X	B	
Crepidodera aurata (Marsham, 1802)	X	X	X			X		CK	
Crepidodera aurea (Geoffroy, 1785)	X	X		N	CK	X	X	CK	
Crepidodera nitidula (Linnaeus, 1758)					CK		X		
Crepidodera plutus (Latreille, 1804)		X	X		N				
Derocrepis sodalis (Kutschera, 1860)		X			CK	B			
Dibolia chryptocephala (Koch, 1803)		X				X	B	CK	
Dibolia femoralis femoralis L. Redtenbacher, 1849	H								
Dibolia occultans (Koch, 1803)	X	X	X		N	N		B	
Dibolia timida (Illiger, 1807)			N		N				
Epitrix atropae Foudras, 1861					B	X			
Epitrix hirtipennis (Melsheimer, 1847)		N							
Epitrix pubescens (Koch, 1803)	X	X			N	X			
Hermaeophaga mercurialis (Fabricius, 1792)	H				N				
Hermaeophaga ruficollis (P.H. Lucas, 1849)		CK							
Hippuriphila modeeri (Linnaeus, 1760)								B	
Longitarsus aeneicollis (Faldermann, 1837)	H			N	CK	X	X	B	
Longitarsus aeneus Kutschera, 1862	H					!			
Longitarsus aeruginosus (Foudras, 1860)	X				N				

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Longitarsus albineus (Foudras, 1860)	N	!	N		N	!			
Longitarsus anacardius (Allard, 1866)					!				
Longitarsus anchusae (Paykull, 1799)				N	CK			B	
Longitarsus atricillus (Linnaeus, 1760)			N						
Longitarsus ballotae (Marsham, 1802)	H						CK	CK	
Longitarsus brisouti Heikertinger, 1912			X					B	
Longitarsus brunneus (Duftschmid, 1825)					N				
Longitarsus cerinthes (Schrank, 1798)					N	X			
Longitarsus codinai Madar & Madar, 1965		X						B	
Longitarsus corynthius (Reiche, 1858)	B	X						CK	
Longitarsus exchii (Koch, 1803)	H								
Longitarsus exsoletus (Linnaeus, 1758)	H		N			X	X		
Longitarsus foudrasi Weise, 1893	X					N		B	
Longitarsus gracilis Kutschera, 1864			N		N				
Longitarsus helvolus Kutschera, 1864					N				
Longitarsus holsaticus (Linnaeus, 1758)			N		N		X	CK	
Longitarsus juncicola (Foudras, 1860)			N					B	
Longitarsus kutscherai (Rye, 1872)					N		X		
Longitarsus lateripunctatus Rosenhauer, 1856		N			N			B	
Longitarsus laureolae Biondi, 1988 [E]					N	B	B	B	
Longitarsus linnaei (Duftschmid, 1825)	H				N			B	
Longitarsus longipennis Kutschera, 1863	X		N				X		
Longitarsus luridus (Scopoli, 1763)	H	X	N	N	N	X	X	B	
Longitarsus lycopi (Foudras, 1860)	X	X	X		N	N		B	
Longitarsus melanocephalus (DeGeer, 1775)	H	X	N		N			CK	
Longitarsus minusculus (Foudras, 1860)	H	X							
Longitarsus monticola Kutschera, 1864			!		N				
Longitarsus nasturtii (Fabricius, 1792)							B		
Longitarsus niger (Koch, 1803)	H					N	X	B	
Longitarsus nigrocillus (Motschulsky, 1849)	H								
Longitarsus nigrofasciatus (Goeze, 1777)	H		N	N	N	N			
Longitarsus obliteratoides Gruev, 1973	B				!			CK	
Longitarsus obliteratus (Rosenhauer, 1847)	H								
Longitarsus ochroleucus (Marsham, 1802)	H			B	N			B	
Longitarsus ordinatus (Foudras, 1860)	X		N						
Longitarsus parvulus (Paykull, 1799)	H	X	X	N	N	X	N	B	
Longitarsus pellucidus (Foudras, 1860)	X	N	N		CK	X	X	B	
Longitarsus pratensis (Panzer, 1794)		X	N		N	N	B	B	
Longitarsus rectelineatus (Foudras, 1860)			!				CK	B	
Longitarsus rubiginosus (Foudras, 1860)		X							
Longitarsus salviae Gruev, 1975					!				
Longitarsus strigicollis Wollaston, 1864	X				N				
Longitarsus substriatus Kutschera, 1864			N						
Longitarsus succineus (Foudras, 1860)	H	N	N		N	B	X	B	
Longitarsus suturellus (Duftschmid, 1825)		X				X			
Longitarsus tabidus (Fabricius, 1775)	H	X						B	
Longitarsus vilis Wollaston, 1864								B	
Lythraria salicariae (Paykull, 1800)		X					N		
Mantura cylindrica Miller, 1881	H								
Mantura lutea (Allard, 1859)		X						B	
Mantura obtusata (Gyllenhal, 1813)							X	B	
Mniophila bosnica Apfelbeck, 1914								B	
Mniophila muscorum muscorum (Koch, 1803)								B	

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Neocrepidodera brevicollis (J. Daniel, 1904)						X	X		
Neocrepidodera corpulenta (Kutschera, 1860)							X	B	
Neocrepidodera ferruginea (Scopoli, 1763)	H			N	N	X	X		
Neocrepidodera impressa impressa (Fabricius, 1801)	H	X	X						
Neocrepidodera melanostoma (L. Redtenbacher, 1849)								B?	
Neocrepidodera transversa (Marsham, 1802)			N			X			
Ochrosis ventralis (Illiger, 1807)	X	X	X		N	X	X	B	
Orestia alpina (Germar, 1824)	H								
Orestia apennina Weise, 1886 [E]					N				
Orestia calabra calabra Heikertinger, 1909 [E]					N		B	B	
Orestia kraatzi Allard, 1861								B	
Phyllotreta astrachanica Lopatin, 1977			N			CK			
Phyllotreta atra (Fabricius, 1775)	H	X	X	CK	N				
Phyllotreta balcanica Heikertinger, 1909		X							
Phyllotreta cruciferae (Goeze, 1777)	H	X	X		N	N	N	N	
Phyllotreta lativittata Kutschera, 1860		B						B	
Phyllotreta nemorum (Linnaeus, 1758)			X		N				
Phyllotreta nigripes (Fabricius, 1775)	H	X	X	CK	CK	X	X	CK	
Phyllotreta nodicornis (Marsham, 1802)					CK	B			
Phyllotreta ochripes (Curtis, 1837)	H				N	N			
Phyllotreta parallela (Boieldieu, 1859)	H				CK			N	
Phyllotreta procera (L. Redtenbacher, 1849)	H	X	X		N	N		N	
Phyllotreta punctulata (Marsham, 1802)	H	X	X	CK	CK	N	X	B	
Phyllotreta rugifrons Küster, 1849		X	X						
Phyllotreta striolata (Illiger, 1803)						CK			
Phyllotreta undulata Kutschera, 1860		X	X						
Phyllotreta variipennis (Boieldieu, 1859)	H			N	N				
Phyllotreta vittula (L. Redtenbacher, 1849)	H	X	X			CK			
Podagrica fuscicornis (Linnaeus, 1767)	H		N	N	N			B	
Podagrica malvae (Illiger, 1807)	H	X		N	N	X		B	
Podagrica menetriesii (Faldermann, 1837)		X							
Psylliodes affinis (Paykull, 1799)				B		N		CK	
Psylliodes algirica Allard, 1859						N		B	
Psylliodes caneparii Leonardi, 2007 [E]								B	
Psylliodes chalcomera (Illiger, 1807)	H	N	X	N	N	X	X	B	
Psylliodes chrysocephala (Linnaeus, 1758)	H	X		N		X	X	B	
Psylliodes circumdata (W. Redtenbacher, 1842)	H							B	
Psylliodes cuprea Koch, 1803	H	X	X	B	N	X	X	B	
Psylliodes dulcamarae Koch, 1803				B					
Psylliodes feroniae Leonardi, 1978 [E]	B				B				
Psylliodes fusiformis (Illiger, 1807)	X				N			B	
Psylliodes gibbosa Allard, 1860	H	X	N					B	
Psylliodes hyoscyami (Linnaeus, 1758)	H						X	B	
Psylliodes instabilis Foudras, 1860	H		N			X			
Psylliodes isatidis Heikertinger, 1913	X			CK			X	CK	
Psylliodes kiesenwetteri Kutschera, 1864	H	X	N	N	N	X	X	B	
Psylliodes laevifrons Kutschera, 1864	H		B	B	B	X	X	B	
Psylliodes laticollis Kutschera, 1864		X					B	B	
Psylliodes leonhardi Heikertinger, 1926 [E]					B			B	
Psylliodes libertii Leonardi, 2013 [E]						B		B	
Psylliodes luteola (O.F. Müller, 1776)	H	X	N		CK	X	X	B	
Psylliodes marcida (Illiger, 1807)	X	X							
Psylliodes milleri Kutschera, 1864	H							B	

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Psylliodes napi (Fabricius, 1792)	H	X	N	N	N	X	X	B	
Psylliodes obscuroaenea Rosenhauer, 1856						X		B	
Psylliodes pallidipennis Rosenhauer, 1856								B	
Psylliodes puncticollis Rosenhauer, 1856	X	X							
Psylliodes pyritosa Kutschera, 1864	H				N		X	B	
Psylliodes ruffoi Leonardi, 1975 [E]		X			CK	X	B	B	
Psylliodes thlaspis Foudras, 1860					N				
Sphaeroderma rubidum (Graells, 1858)	H	X	N	N	N	X	X	B	
Sphaeroderma testaceum (Fabricius, 1775)					CK		X	B	
Lamprosomatinae Lacordaire, 1848 Konstantinov in Cat. Pal. Col., vol. 6, 2010									
Oomorphus concolor (Sturm, 1807)		N			N	N			
Cryptocephalinae Gyllenhal, 1813 **Clytrini** Kirby, 1837 **Clytrina** Kirby, 1837 Regalin & Medvedev in Cat. Pal. Col., vol. 6, 2010									
Cheilotoma erythrostoma italica Leoni, 1906	X	X	X		N	X	X		
Cheilotoma musciformis musciformis (Goeze, 1777)	H		X				X	B	
Clytra laeviuscula Ratzeburg, 1837	X	X		N		X	X	N	
Clytra quadripunctata quadripunctata (Linnaeus, 1758)			X			X		B	
Coptocephala scopolina kuesteri Kraatz, 1872	H	X	X		N	N	X	N	
Coptocephala unicolor (P.H. Lucas, 1845)			N		N			N	
Coptocephala unifasciata unifasciata (Scopoli, 1763)	X	X	X	N	N	X	X		
Labidostomis humeralis (D.H. Schneider, 1792)	X								
Labidostomis longimana (Linnaeus, 1760)	X		X	B	N	X	X		
Labidostomis pallidipennis (Gebler, 1830)	X				N	X			
Labidostomis taxicornis taxicornis (Fabricius, 1792)	H			N	N	X	X	N	
Labidostomis tridentata (Linnaeus, 1758)								B	
Lachnaia italica italica Weise, 1881	H	X		N	N	X	X		
Lachnaia sexpunctata (Scopoli, 1763)					N				
Macrolenes dentipes (A.G. Olivier, 1808)	H	X	N	N	N	X	X	N	
Smaragdina affinis affinis (Illiger, 1794)	H		X	B	N	X			
Smaragdina aurita aurita (Linnaeus, 1767)	H					X	X	N	
Smaragdina concolor concolor (Fabricius, 1792)				N	N	X	X	N	
Smaragdina salicina (Scopoli, 1763)	H				N	X			
Tituboea biguttata (A.G. Olivier, 1791)	H			N		X	X		
Cryptocephalini Gyllenhal, 1813 **Cryptocephalina** Gyllenhal, 1813 Lopatin, Smetana & Schöller in Cat. Pal. Col., vol. 6, 2010									
Cryptocephalus anticus Suffrian, 1848	X	X	X						
Cryptocephalus aureolus aureolus Suffrian, 1847				N		X	X		
Cryptocephalus bameuli Duhaldeborde, 1999						CK			
Cryptocephalus bilineatus (Linnaeus, 1767)							CK		
Cryptocephalus bimaculatus Fabricius, 1781						!	CK		
Cryptocephalus bipunctatus bipunctatus (Linnaeus, 1758)	H	X	X		CK	B	X	B	
Cryptocephalus connexus A.G. Olivier, 1807	X		X	N	CK	X	X		
Cryptocephalus cyanipes Suffrian, 1847						N	X		
Cryptocephalus czwalinae Weise, 1882 [E]	H				CK	X	X	B	
Cryptocephalus daccordii Biondi, 1995 [E]		B				CK		B	
Cryptocephalus decemmaculatus (Linnaeus, 1758)	H								
Cryptocephalus elegantulus Gravenhorst, 1807	N								
Cryptocephalus etruscus Suffrian, 1847	B	B	N	B	B	X	B	B	

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Cryptocephalus falzonii Burlini, 1956 [E]			X	N	N	X	X	B	
Cryptocephalus flavipes Fabricius, 1781	H			N	CK	X		N	
Cryptocephalus frenatus Laicharting, 1781	B								
Cryptocephalus frontalis Marsham, 1802						N			
Cryptocephalus fulvus fulvus (Goeze, 1777)	H	X	X	N	N	X	X	CK	
Cryptocephalus imperialis Laicharting, 1781						X			
Cryptocephalus informis Suffrian, 1847						N			
Cryptocephalus labiatus (Linnaeus, 1760)	H	X	CK	CK	CK	X	X		
Cryptocephalus leonhardi Breit, 1918						X	B		
Cryptocephalus loreyi Solier, 1837				B	CK	CK	X	B	
Cryptocephalus macellus Suffrian, 1860	B			N	N	X		B	
Cryptocephalus marginatus Fabricius, 1781					CK	X			
Cryptocephalus moraei (Linnaeus, 1758)	H		X	N		X	X		
Cryptocephalus nitidus (Linnaeus, 1758)				B	CK	X	X	CK	
Cryptocephalus ocellatus ocellatus Drapiez, 1819	N			B	N	X	X	B	
Cryptocephalus ochroleucus ochroleucus Fairmaire, 1859					CK				
Cryptocephalus octomaculatus P. Rossi, 1790							CK		
Cryptocephalus parvulus O.F. Müller, 1776		X							
Cryptocephalus pini pini (Linnaeus, 1758)						CK			
Cryptocephalus politus politus Suffrian, 1853								CK	
Cryptocephalus populi Suffrian, 1848		CK							
Cryptocephalus pygmaeus vittula Suffrian, 1848	B		X	B		X	X		
Cryptocephalus renatae Sassi, 2001	B	X	X			N	X	B	
Cryptocephalus rufipes (Goeze, 1777)								N	
Cryptocephalus rugicollis A.G. Olivier, 1791	H	X	X	N	CK	X	CK	CK	
Cryptocephalus samniticus Leonardi & Sassi, 2001 [E]	!	B	B		B	B			
Cryptocephalus scapularis Suffrian, 1848		X			CK	X	X	B	
Cryptocephalus sexpunctatus sexpunctatus Linnaeus, 1758				!					
Cryptocephalus signatifrons Suffrian, 1847	X	X			CK		X	N	
Cryptocephalus stragula P. Rossi, 1794	X								
Cryptocephalus strigosus Germar, 1824	X						X		
Cryptocephalus tricolor P. Rossi, 1792	H	X	X	B	CK	X	X		
Cryptocephalus trimaculatus P. Rossi, 1790	H		CK		CK	X	X	N	
Cryptocephalus turcicus Suffrian, 1847	H		X	N	CK	B			
Cryptocephalus zambanellus Marsham, 1875				N	CK	X	X	B	
Pachybrachina Chapuis, 1874 Schöller, Löbl & Lopatin in Cat. Pal. Col., vol. 6, 2010									
Pachybrachis exclusus (Rey, 1883)	H	X		N	N	X	X	B	
Pachybrachis fimbriolatus (Suffrian, 1848)			X			X			
Pachybrachis hieroglyphicus (Laicharting, 1781)	CK	CK			N	N	N		
Pachybrachis hippophaes (Suffrian, 1848)							N		
Pachybrachis karamani (Weise, 1893)		CK							
Pachybrachis ruffoi ruffoi Burlini, 1957 [E]						X	X	B	
Pachybrachis salfii Burlini, 1957	CK					X			
Pachybrachis scriptus Herrich-Schäffer, 1838	X								
Pachybrachis tessellatus (A.G. Olivier, 1791)	X								
Stylosomina Chapuis, 1874									
Stylosomus minutissimus (Germar, 1824)	X							CK	
Stylosomus tamaricis (Herrich-Schäffer, 1836)		N							
Eumolpinae Hope, 1840 **Bromiini** Chapuis, 1874 Moseyko & Sprecher-Uebersax in Cat. Pal. Col., vol. 6, 2010									
Bromius obscurus (Linnaeus, 1758)						N	X		

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Colaspidea nitida P.H. Lucas, 1846	H	X						B	
Pachnephorus bistriatus Mulsant & Wachanru, 1852	X	X							
Pachnephorus cylindricus P.H. Lucas, 1849		X						N	
Pachnephorus tessellatus (Duftschmid, 1825)		N	N		N				
Pachnephorus villosus (Duftschmid, 1825)	X	X							
CURCULIONOIDEA Latreille, 1802									
Alonso-Zarazaga et. al., 2017, Coop. Cat. Curculionoidea									
NEMONYCHIDAE Bedel, 1882									
Nemonyx lepturoides (Fabricius, 1801)						X			
ANTHRIBIDAE Billberg, 1820									
Anthribinae Billberg, 1820									
Anthribini Billberg, 1820									
Anthribus fasciatus Forster, 1770	B	X		N		X	X	N	LC
Discotenini Lacordaire, 1865									
Enedreytes hilaris Fåhraeus, 1839	X	X				N		B	LC
Pseudeuparius centromaculatus (Gyllenhal, 1833)	B	X	B					B	LC
Pseudeuparius sepicola (Fabricius, 1792)		B							LC
Piesocorynini Valentine, 1960									
Phaenotherion fasciculatum fasciculatum Reitter, 1891 [E]		X	X	N	B	X	X	B	LC
Platyrhinini Imhoff, 1856									
Platyrhinus resinosus (Scopoli, 1763)	X	X		N	B	X	B	B	LC
Ulorhinus bilineatus (Germar, 1819)	H	X			B	B			LC
Platystomini Pierce, 1916									
Platystomos albinus (Linnaeus, 1758)	H	X				X	X	N	LC
Zygaenodini Lacordaire, 1865									
Dissoleucas niveirostris (Fabricius, 1798)	X		B		B	X	X	B	LC
Noxius curtirostris (Mulsant & Rey, 1861)	B	B							LC
Rhaphitropis marchica (Herbst, 1797)					B				LC
Rhaphitropis oxyacanthae (C.N.F. Brisout de Barneville, 1863)				B	B	N			LC
Choraginae Kirby, 1819									
Choragini Kirby, 1819									
Choragus sheppardi Kirby, 1819	B								LC
Urodontinae C.G. Thomson, 1859									
Bruchela flavescens (Küster, 1850)	H	X	X					N	
Bruchela rufipes rufipes (A.G. Olivier, 1790	B								
ATTELABIDAE Billberg, 1820									
Attelabinae Billberg, 1820									
Apoderini Jekel, 1860									
Apoderina Jekel, 1860									
Apoderus coryli (Linnaeus, 1758)	CK			CK	CK	X	X	CK	
Attelabini Billberg, 1820									
Attelabus nitens (Scopoli, 1763)	H	X	X	CK	CK	X	X	B	
Rhynchitinae Gistel, 1848									
Auletini Desbrochers des Loges, 1908									
Auletina Desbrochers des Loges, 1908									
Auletes tubicen Schönherr, 1826	B								
Pseudomesauletina Legalov, 2003									
Aletinus maculipennis (Jacquelin du Val, 1854)								B	
Eomesauletes politus (Lepeletier & Audinet-Serville, 1825)	H				CK	X	X	B	

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Mesauletobius pubescens (Kiesenwetter, 1852)	CK			CK	CK				
Byctiscini Voss, 1923									
Byctiscina Voss, 1923									
Byctiscus betulae (Linnaeus, 1758)	H			N		X	X	B	
Byctiscus populi (Linnaeus, 1758)				CK		X		CK	
Deporaini Voss, 1929									
Chonostropheina Morimoto, 1962									
Chonostropheus seminiger (Reitter, 1881)				N		X	X	B	
Deporaina Voss, 1929									
Caenorhinus megacephalus (Germar, 1823)				B					
Deporaus betulae (Linnaeus, 1758)	H	CK		CK		N	X	CK	
Rhynchitini Gistel, 1848									
Involvulus icosandriae icosandriae (Scopoli, 1763)	H	CK	X		CK	X	X	B	
Involvulus pubescens (Fabricius, 1775)				CK	CK		X		
Lasiorhynchites cavifrons (Gyllenhal, 1833)	H	X			CK				
Lasiorhynchites comatus (Gyllenhal, 1833)	CK				CK				
Lasiorhynchites praeustus (Boheman, 1845)	X	X		N	CK	X	X	CK	
Lasiorhynchites sericeus (Herbst, 1797)	H			CK	CK	X		B	
Mecorhis aethiops (Bach, 1854)					B				
Neocoenorrhinus abeillei (Desbrochers des Loges, 1869)	H				CK	CK			
Neocoenorrhinus germanicus (Herbst, 1797)	H		X		CK	X	X	B	
Neocoenorrhinus interpunctatus (Stephens, 1831)		X			CK	X		B	
Neocoenorrhinus minutus (Herbst, 1797)	H				CK				
Neocoenorrhinus pauxillus (Germar, 1823)	H	X	X	N	CK	X	X	CK	
Rhodocyrtus cribripennis (Desbrochers des Loges, 1869)	X				CK				
Rhynchites auratus (Scopoli, 1763)	H		X	CK	CK	CK	X	CK	
Rhynchites bacchus (Linnaeus, 1758)	H	X		N	CK	X	X	CK	
Rhynchites giganteus Schönherr, 1832	X	X		CK	CK	X	X	CK	
Tatyanaerhynchites aequatus (Linnaeus, 1767)	H	X	X	N	CK	X	X	B	
Temnocerus coeruleus (Fabricius, 1798)	H	X	CK		CK	X	X	B	
Temnocerus nanus (Paykull, 1792)	CK	X		N	CK	X	X		
BRENTIDAE Billberg, 1820 (sensu lato)									
Apioninae Schönherr, 1823									
Apionini Schönherr, 1823									
Apionina Schönherr, 1823									
Apion cruentatum Walton, 1844						X	X	B	
Apion frumentarium (Linnaeus, 1758)	X	X	X	N			N	B	
Apion haematodes haematodes Kirby, 1808	X			N		X	X	N	
Apion longithorax Desbrochers des Loges, 1889							X	B	
Aplemonina Kissinger, 1968									
Perapion affine (Kirby, 1808)							N		
Perapion curtirostre (Germar, 1817)	X			N		X	X	N	
Perapion hydrolapathi (Marsham, 1802)	H	X	X	N	N	X	X		
Perapion ilvense (Wagner, 1905)	X	X				X	X	B	
Perapion marchicum (Herbst, 1797)							X	B	
Perapion violaceum violaceum (Kirby, 1808)	H	X	X	N	N	X	X	B	
Phrissotrichum tubiferum (Gyllenhal, 1833)	X				N	N		B	
Pseudoperapion brevirostre (Herbst, 1797)	H		X	N	N	X	X		
Pseudostenapion simum (Germar, 1817)		X			N	X	X	N	
Aspidapiina Alonso-Zarazaga, 1990									
Aspidapion aeneum (Fabricius, 1775)	H	X	X	N	N	X	X	B	
Aspidapion caprai Giusto, 1993 [E]				B				B	

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Aspidapion radiolus (Marsham, 1802)	H	X	X	B	N	X	X	B	
Aspidapion soror (Rey, 1895)			X			X	X	B	
Catapiina Alonso-Zarazaga, 1990									
Catapion burdigalense (Wencker, 1859)	H								
Catapion calabricum (A. Solari & F. Solari, 1922) [E]				B			X	B	
Catapion corsicum (Desbrochers des Loges, 1888)	H							N	
Catapion curtisii (Stephens, 1831)	H							B	
Catapion jaffense (Desbrochers des Loges, 1896)	X		X		N		X		
Catapion meieri (Desbrochers des Loges, 1901)		B							
Catapion pubescens (Kirby, 1811)	H	X	X		N	X	X	B	
Catapion seniculus (Kirby, 1808)	H		X	N	N	X	X	N	
Catapion seriatosetosulum (Wencker, 1864)	H		X			X		B	
Ceratapiina Alonso-Zarazaga, 1990									
Acentrotypus brunnipes (Boheman, 1839)	B								
Ceratapion armatum (Gerstaecker, 1854)								B	
Ceratapion basicorne (Illiger, 1807)			X						
Ceratapion carduorum (Kirby, 1808)	H	X		B		X	X	B	
Ceratapion cylindricolle (Gyllenhal, 1839)	B		X			B			
Ceratapion damryi (Desbrochers des Loges, 1894)						X	X?		
Ceratapion gibbirostre (Gyllenhal, 1813)			X						
Ceratapion onopordi onopordi (Kirby, 1808)	H		X	N		X	X	B	
Ceratapion penetrans penetrans (Germar, 1817)	H		X			X			
Ceratapion robusticorne (Desbrochers des Loges, 1866)	B								
Ceratapion scalptum scalptum (Mulsant & Rey, 1859)							X		
Diplapion confluens (Kirby, 1808)	H	X	X					B	
Diplapion detritum (Mulsant & Rey, 1859)	H		X						
Diplapion stolidum (Germar, 1817)	X			N		X			
Omphalapion dispar (Germar, 1817)		X				X	X	N	
Omphalapion hookerorum (Kirby, 1808)							X		
Omphalapion laevigatum (Paykull, 1792)		X							
Exapiina Alonso-Zarazaga, 1990									
Exapion difficile (Herbst, 1797)	X						X		
Exapion elongatulum (Desbrochers des Loges, 1891)						X			
Exapion formaneki (Wagner, 1929)	H			N	N	X			
Exapion fuscirostre fuscirostre (Fabricius, 1775)					N	X			
Exapion genistae (Kirby, 1811)	X								
Exapion subparallelum (Desbrochers des Loges, 1888)		B						B	
Ixapiina Alonso-Zarazaga, 1990									
Trichopterapion holosericeum (Gyllenhal, 1833)	H	X			N		X		
Kalcapiina Alonso-Zarazaga, 1990									
Kalcapion semivittatum semivittatum (Gyllenhal, 1833)	H			N		X	N	B	
Melanapion minimum (Herbst, 1797)	X		X	N	N	X	X	B	
Squamapion atomarium (Kirby, 1808)						X			
Squamapion leucophaeatum (Wencker, 1864)			X					N	
Squamapion minutissimum (Rosenhauer, 1856)							B		
Squamapion vicinum (Kirby, 1808)							N		
Taeniapion rufescens (Gyllenhal, 1833)	H							N	
Taeniapion urticarium urticarium (Herbst, 1784)	H			B	N	X		B	
Malvapiina Alonso-Zarazaga, 1990									
Malvapion malvae (Fabricius, 1775)	H	X		N	N	X		B	
Pseudapion fulvirostre (Gyllenhal, 1833)	H	X	N		N	N			
Pseudapion rufirostre (Fabricius, 1775)	H	X		N	N	X	X		

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Rhopalapion longirostre (A.G. Olivier, 1807)	N						X		
Oxystomatina Alonso-Zarazaga, 1990									
Cyanapion afer (Gyllenhal, 1833)	X		X						
Cyanapion alcyoneum (Germar, 1817)						X	X		
Cyanapion gyllenhali (Kirby, 1808)	H			N		X	X	B	
Cyanapion platalea (Germar, 1817)	H								
Cyanapion spencii (Kirby, 1808)	H						X		
Eutrichapion ervi (Kirby, 1808)	H			N	N	X		B	
Eutrichapion facetum (Gyllenhal, 1839)				N	N	X	X	N	
Eutrichapion melancholicum (Wencker, 1864)						X	X		
Eutrichapion punctiger (Paykull, 1792)	H			N	N	N		B	
Eutrichapion viciae (Paykull, 1800)	H	X		N	N	X	X	B	
Eutrichapion vorax (Herbst, 1797)	H	X	X	N	N	X	X	B	
Hemitrichapion filicorne (Wencker, 1864)				N		X			
Hemitrichapion juniperi (Boheman, 1839)						X			
Hemitrichapion lethierryi (Desbrochers des Loges, 1870)						X			
Hemitrichapion pavidum (Germar, 1817)			X						
Hemitrichapion reflexum (Gyllenhal, 1833)				N		X		N	
Holotrichapion aethiops (Herbst, 1797)						X	X	B	
Holotrichapion antennale (Desbrochers des Loges, 1896)					N	X		B	
Holotrichapion gracilicolle (Gyllenhal, 1839)	H				N	X	X	B	
Holotrichapion ononis (Kirby, 1808)	H		X	N	N	X	N	B	
Holotrichapion pisi (Fabricius, 1801)	H	X	X	N	N	X	X	B	
Ischnopterapion cognatum (Hochhuth, 1851)			B	N		X			
Ischnopterapion fallens (Marseul, 1888)			X		N	X			
Ischnopterapion loti (Kirby, 1808)	H	X	X			X	X	B	
Ischnopterapion modestum (Germar, 1817)		N							
Ischnopterapion plumbeomicans plumbeomicans (Rosenhauer, 1856)	X	X							
Ischnopterapion virens (Herbst, 1797)	H	X	X	B	N	X	X	B	
Oryxolaemus croceifemoratus (Gyllenhal, 1839)	B	X				X	X	B	
Oryxolaemus scabiosus (Weise, 1889)	B				N	B	X	B	
Oxystoma cerdo (Gerstaecker, 1854)	H			N		X	X	B	
Oxystoma craccae (Linnaeus, 1767)	H					X	X		
Oxystoma dimidiatum (Desbrochers des Loges, 1897)	X		X	N	N	X			
Oxystoma ochropus (Germar, 1818)	H	X				X	X	N	
Oxystoma opeticum Bach, 1854						X			
Oxystoma pomonae (Fabricius, 1798)		X	X	N	N	X	X	B	
Oxystoma subulatum (Kirby, 1808)			X	B	N		X		
Pirapion immune (Kirby, 1808)	N					X	X		
Stenopterapion meliloti (Kirby, 1808)		N							
Stenopterapion tenue (Kirby, 1808)	H	X	X	N	N	X	N	N	
Synapion falzonii (Schatzmayr, 1922)						X			
Piezotrachelina Voss, 1959									
Protapion angusticolle (Gyllenhal, 1833)			X						
Protapion apricans (Herbst, 1797)	H	X	X	N	N	X	N	B	
Protapion assimile assimile (Kirby, 1808)	H			N	N	X	X	B	
Protapion dentipes (Gerstaecker, 1854)	H	X	X	N	N	X		B	
Protapion difforme (Germar, 1818)	N	X						N	
Protapion dissimile (Germar, 1817)	H					X		B	
Protapion fulvipes fulvipes (Geoffroy, 1785)	N		X		N	X	N	N	
Protapion interjectum interjectum (Desbrochers des Loges, 1895)	H	X	X		N	X		B	
Protapion laevicolle (Kirby, 1811)	H		X	N	N	X	X	B	

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Protapion nigricrus (Desbrochers des Loges, 1895)		X	X	N	N	X	X		
Protapion nigritarse (Kirby, 1808)	H	X	X		N	X	X	B	
Protapion ononidis (Gyllenhal, 1827)	X		X		N	X	X	B	
Protapion schoenherri (Boheman, 1839)	H		X		N	X	X	N	
Protapion trifolii (Linnaeus, 1768)	N	X	X	N	N	X	X	B	
Protapion varipes (Germar, 1817)	X	X	X					B	
Pseudoprotapion astragali (Paykull, 1800)		X		N	N	X	X	B	
Pseudoprotapion elegantulum (Germar, 1818)						X			
Brentinae Billberg, 1820 **Brentini** Billberg, 1820 **Eremoxenina** Semenov, 1892									
Amorphocephala coronata (Germar, 1817)	X	B	X		B	N		B	LC
Nanophyinae Gistel, 1848 **Corimaliini** Alonso-Zarazaga, 1989									
Allomalia quadrivirgata (A. Costa, 1863)	N	X						B	
Corimalia pallida (A.G. Olivier, 1807)		X						B	
Corimalia postica (Gyllenhal, 1838)								B	
Corimalia tamarisci (Gyllenhal, 1838)	X	X						B	
Hypophyes pallidulus (Gravenhorst, 1807)	N	N						B	
Nanophyini Gistel, 1848									
Dieckmanniellus chevrieri (Boheman, 1845)			X						
Dieckmanniellus gracilis (L. Redtenbacher, 1847)								B	
Dieckmanniellus nigritarsis (Aubé, 1862)								B	
Dieckmanniellus nitidulus (Gyllenhal, 1838)	H	X				X	X	B	
Nanomimus hemisphaericus (A.G. Olivier, 1807)	X		X					B	
Nanophyes brevis brevis Boheman, 1845	X		X						
Nanophyes brevis fallax Rey, 1893		X							
Nanophyes marmoratus marmoratus (Goeze, 1777)		X	X						
Nanophyes rubricus Rosenhauer, 1856			N						
CURCULIONIDAE Latreille, 1802 s.l. **Bagoinae** C.G. Thomson, 1859									
Bagous argillaceus Gyllenhal, 1836		B	X					B	
Bagous biimpressus Fåhraeus, 1845		B							
Bagous costulatus Perris, 1869			X		N			N	
Bagous limosus (Gyllenhal, 1827)	CK		X	N					
Bagous longirostris Vitale, 1904			B					B	
Bagous lutulentus (Gyllenhal, 1813)		X	X					CK	
Bagous robustus H. Brisout de Barneville, 1863		CK							
Bagous rufimanus Péricart, 1989			X						
Brachycerinae Billberg, 1820 **Brachycerini** Billberg, 1820 **Brachycerina** Billberg, 1820									
Brachycerus albidentatus Gyllenhal, 1840		B						B	
Brachycerus junix Liechtenstein, 1896	X	N						B	
Brachycerus lutosus Gyllenhal, 1833	X								
Brachycerus muricatus A.G. Olivier, 1790	H							B	
Brachycerus undatus Fabricius, 1798	H	X			N	N		B	
Erirhinini Schönherr, 1825 **Erirhinina** Schönherr, 1825									
Notaris acridulus (Linnaeus, 1758)		N							
Notaris scirpi (Fabricius, 1792)	X	X	X		N	N		N	

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Thryogenes festucae (Herbst, 1795)		N							
Ocladiina Lacordaire, 1865									
Jekelia notata Mulsant & Godart, 1868	H								
Raymondionymini Reitter, 1913									
Alaocyba marcuzzii G. Osella, 1977 [E]					B				
Ferreria marqueti appenina (Dieck, 1869) [E]	X			B	B				
Raymondiellus pacei G. Osella, 1977	N	B			N	B			
Tanysphyrini Gistel, 1848									
Tanysphyrus lemnae (Paykull, 1792)	H	N	X	N					
Conoderinae Schönherr, 1833 **Bariditae** Schönherr, 1836 **Apostasimerini** Schönherr, 1844 **Zygobaridina** Pierce, 1907									
Limnobaris dolorosa (Goeze, 1777)			X						
Limnobaris t-album (Linnaeus, 1758)			X		N	X			
Baridini Schönherr, 1836 **Baridina** Schönherr, 1836									
Aulacobaris angusta angusta (Brullé, 1832)		X					X		
Aulacobaris caerulescens caerulescens (Scopoli, 1763)		X							
Aulacobaris chlorizans (Germar, 1823)	H	N							
Aulacobaris cuprirostris cuprirostris (Fabricius, 1787)	H								
Aulacobaris fallax (Heyden, 1868)	X	X							
Aulacobaris kaufmanni (Reitter, 1897)	B					X	X		
Aulacobaris pertusa (Kiesenwetter, 1864)	B		B						
Aulacobaris picicornis picicornis (Marsham, 1802)	B		N						
Aulacobaris prasina prasina (Boheman, 1836)			B		B				
Baris analis analis (A.G. Olivier, 1791)	X	X	N						
Baris artemisiae (Panzer, 1794)	X		N		N				
Labiaticola atricolor (Boheman, 1844)	B								
Malvaevora timida timida (P. Rossi, 1792)	X	N		N		X	X		
Maurobaris spoliata (Boheman, 1836)		X						N	
Madarini Jekel, 1865 **Leptoschoinina** Lacordaire, 1865									
Cucubaris villae (Comolli, 1837)	H								
Neosharpiini A. Hoffmann, 1956									
Amalus scortillum (Herbst, 1795)						X			
Ceutorhynchini Gistel, 1848									
Calosirus terminatus (Herbst, 1795)		B	X	B		X	X	B	
Ceutorhynchus aeneicollis Germar, 1823		X							
Ceutorhynchus assimilis (Paykull, 1792)	H	X	N	B	N	X	X	B	
Ceutorhynchus atomus Boheman, 1845	H		X		N	X	X	N	
Ceutorhynchus barbareae Suffrian, 1847						X	X		
Ceutorhynchus chalibaeus Germar, 1823	H	X		N	N	X	X	B	
Ceutorhynchus cochleariae (Gyllenhal, 1813)					N				
Ceutorhynchus contractus (Marsham, 1802)	H	B	X	N	N	X	X	B	
Ceutorhynchus declivis Colonnelli, 1988 [E]					N	B			
Ceutorhynchus duvali C.N.F. Brisout de Barneville, 1869	H	X	X	N	N	X	X	B	
Ceutorhynchus erysimi (Fabricius, 1787)	H	X	X	N	N	X	X	B	
Ceutorhynchus fallax Boheman, 1845		X	X		N	X			
Ceutorhynchus fulvitarsis Gougelet & H. Brisout de Barneville, 1860	H				N				
Ceutorhynchus gallorhenanus F. Solari, 1949		B							

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Ceutorhynchus grenieri Gougelet & H. Brisout de Barneville, 1860		X							
Ceutorhynchus griseus C.N.F. Brisout de Barneville, 1869	X								
Ceutorhynchus hepaticus Gyllenhal, 1837			N						
Ceutorhynchus hirtulus Germar, 1823	H	B				X		B	
Ceutorhynchus inaffectatus Gyllenhal, 1837		X				X			
Ceutorhynchus laetus Rosenhauer, 1856	H					X			
Ceutorhynchus leonhardi F. Solari, 1932 [E]	H								
Ceutorhynchus leprieuri C.N.F. Brisout de Barneville, 1881	X	X	X					N	
Ceutorhynchus littoralis Schultze, 1898	X								
Ceutorhynchus magnanoi Colonnelli, 2011 [E]		B							
Ceutorhynchus matthiolae A. Hoffmann, 1955		B							
Ceutorhynchus melitensis Schultze, 1900	X	B							
Ceutorhynchus micans C.N.F. Brisout de Barneville, 1869		B							
Ceutorhynchus nanus Gyllenhal, 1837	H								
Ceutorhynchus obstrictus (Marsham, 1802)			X						
Ceutorhynchus pallidactylus (Marsham, 1802)	H	X	X		N	N		B	
Ceutorhynchus pantellarianus A. Hoffmann, 1964		B							
Ceutorhynchus picitarsis Gyllenhal, 1837	H	X	X	N	N	X	X	B	
Ceutorhynchus posthumus Germar, 1823	H								
Ceutorhynchus puncticollis Boheman, 1845	B								
Ceutorhynchus roberti Gyllenhal, 1837					N				
Ceutorhynchus rusticus Gyllenhal, 1837				N					
Ceutorhynchus scrobicollis Neresheimer & Wagner, 1924					B				
Ceutorhynchus striatellus Schultze, 1900			X			X			
Ceutorhynchus sulcicollis (Paykull, 1800)	H		X	N	N	X	X	N	
Ceutorhynchus typhae (Herbst, 1795)	H					X	X		
Ceutorhynchus unguicularis C.G. Thomson, 1871	H		X			X			
Ceutorhynchus viridipennis C.N.F. Brisout de Barneville, 1869	H	X		N			X	B	
Coeliastes lamii (Fabricius, 1792)					N			B	
Coeliodes angulipennis F. Solari, 1940 [E]	X						X		
Coeliodes ilicis (Bedel, 1885)		X	X						
Coeliodes rana (Fabricius, 1787)	H						N		
Coeliodes ruber (Marsham, 1802)	H		X		N			N	
Coeliodes transversealbofasciatus (Goeze, 1777)	N							N	
Datonychus arquata (Herbst, 1795)								B	
Datonychus melanostictus (Marsham, 1802)		X	X		N	N	X	N	
Datonychus urticae (Boheman, 1845)	H				N	X		B	
Drupenatus nasturtii (Germar, 1823)	X	B	X						
Glocianus distinctus (C.N.F. Brisout de Barneville, 1870)	H	N	X	N		X		B	
Glocianus maculaalba (Herbst, 1795)		X				X			
Glocianus punctiger (C.R. Sahlberg, 1835)		X				X	X		
Glocianus ragusae (C.N.F. Brisout de Barneville, 1884)	H	X						B	
Hadroplontus trimaculatus (Fabricius, 1775)	H	X		N	N	X	X	B	
Microplontus campestris (Gyllenhal, 1837)	H								
Microplontus fairmairii (C.N.F. Brisout de Barneville, 1881)				N		X			
Microplontus molitor (Gyllenhal, 1837)	H								
Microplontus rugulosus (Herbst, 1795)	H	X			N	N		B	
Mogulones amplipennis (Schultze, 1897)			X		N				
Mogulones annibal (Desbrochers des Loges, 1896)		X							
Mogulones asperifoliarum (Gyllenhal, 1813)	H		N		N	N	X	B	
Mogulones aubei (Boheman, 1845)								B	
Mogulones beckeri (Schultze, 1900)	H		N						
Mogulones crucifer (Pallas, 1771)					N	X	X	B	

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Mogulones geographicus (Goeze, 1777)	H	X		N		X	X		
Mogulones javetii (Gerhardt, 1867)	H	X							
Mogulones lucanus (Colonnelli, 1983) [E]		X			N	X			
Mogulones pallidicornis (Gougelet & H. Brisout de Barneville, 1860)						X			
Mogulones t-album (Gyllenhal, 1837)	X					X			
Nedyus quadrimaculatus (Linnaeus, 1758)	H	X		N	N	X	X	B	
Neoprohinus cinnamomeus (Schultze, 1897)	H	X					X	B	
Oprohinus consputus (Germar, 1823)	H	X	X	N		X		N	
Parethelcus pollinarius (Forster, 1771)	H								
Phoeniconyx gobbii (Colonnelli, 1978) [E]		X							
Phrydiuchus topiarius (Germar, 1823)	H								
Pseudocoeliodes rubricus (Gyllenhal, 1837)	H					X			
Sirocalodes depressicollis (Gyllenhal, 1813)		B							
Sirocalodes mixtus (Mulsant & Rey, 1859)	H			N					
Stenocarus cardui (Herbst, 1784)			X		C				
Stenocarus ruficornis (Stephens, 1831)		X		N		X			
Thamiocolus pubicollis (Gyllenhal, 1837)	X						X		
Thamiocolus sinapis (Desbrochers des Loges, 1893)	H								
Thamiocolus uniformis (Gyllenhal, 1837)	H								
Trichosirocalus horridus (Panzer, 1801)	H			N		X	X		
Trichosirocalus rufulus (Dufour, 1851)	X	X	X			X	X	B	
Trichosirocalus troglodytes (Fabricius, 1787)		X	X	N	N	X	X	B	
Trichosirocalus urens (Gyllenhal, 1837)						X		B	
Zacladus exiguus (A.G. Olivier, 1807)	H	X	X		N	X			
Zacladus geranii (Paykull, 1800)	H	X		N		X		N	
Mononychini LeConte, 1876									
Mononychus punctumalbum (Herbst, 1784)	H	N							
Phytobiini Gistel, 1848									
Neophytobius granatus (Gyllenhal, 1835)					N				
Pelenomus quadrituberculatus (Fabricius, 1787)			X			X			
Phytobius leucogaster (Marsham, 1802)		N	X		N				
Rhinoncus bruchoides (Herbst, 1784)				B					
Rhinoncus pericarpius (Linnaeus, 1758)	X	X	N	N	N	X	X		
Rhinoncus perpendicularis (Reich, 1797)	H		X		N				
Scleropterini Schultze, 1902									
Scleropteridius fallax Otto, 1897						X			
Conoderitae Schönherr, 1833 **Orobitidini** C.G. Thomson, 1859									
Orobitis nigrina Reitter, 1885								B	
Choerorhinini Folwaczny, 1973									
Choerorhinus squalidus Fairmaire, 1858		CK			!				LC
Cossonini Schönherr, 1825									
Mesites cunipes Boheman, 1838		X		N	N	X			LC
Mesites pallidipennis Boheman, 1838	CK	X			N			CK	LC
Dryotribini LeConte, 1876									
Amaurorhinus mediterraneus Folwaczny, 1973					CK				DD
Cotaster kostali Diotti, Pesarini & Caldara, 2015 [E]						B	B	B	LC
Cotaster uncipes (Boheman, 1838)				N	B	X	X	B	LC
Onycholipini Wollaston, 1873									
Brachytemnus porcatus (Germar, 1823)	CK	B		N	N	X	X	CK	LC
Hexarthrum exiguum (Boheman, 1838)	B	B						N	DD

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Stenoscelis submuricata (Schönherr, 1832)		B				N	X	B	LC
Stereocorynes truncorum (Germar, 1823)						X			LC
Rhyncolini Gistel, 1848									
Phloeophagina Voss, 1955									
Melicius cylindrus (Boheman, 1838)	CK	X			N	N	!		LC
Phloeophagus lignarius (Marsham, 1802)	X	B			N	X	X		LC
Rhyncolina Gistel, 1848									
Aphanommata filum (Mulsant & Rey, 1859)		B							NT
Rhyncolus ater ater (Linnaeus, 1758)						CK			LC
Rhyncolus elongatus (Gyllenhal, 1827)				N	N	X	X	B	LC
Rhyncolus punctatulus Boheman, 1838	CK	B		N	N	X	X		LC
Rhyncolus reflexus Boheman, 1838	CK	B							LC
Rhyncolus sculpturatus Waltl, 1839		CK							LC
Curculioninae Latreille, 1802									
Acalyptini C.G. Thomson, 1859									
Acalyptus carpini (Fabricius, 1792)		N			N				
Anoplini Bedel, 1884									
Anoplus roboris Suffrian, 1840							N		
Anoplus setulosus setulosus Kirsch, 1870								N	
Anthonomini C.G. Thomson, 1859									
Anthonomus bituberculatus C.G. Thomson, 1868	X	X							
Anthonomus chevrolati chevrolati Desbrochers des Loges, 1868	H	X				X			
Anthonomus kirschi Desbrochers des Loges, 1868						X		N	
Anthonomus multifasciatus Pic, 1926	X	X							
Anthonomus pedicularius (Linnaeus, 1758)	H	X	X		N	X	X	N	
Anthonomus pomorum (Linnaeus, 1758)	H	B		N	N	X	X	N	
Anthonomus pyri Gyllenhal, 1835		X				N			
Anthonomus rubi (Herbst, 1795)	H	X	X	B	N	X	X	B	
Anthonomus rufus Gyllenhal, 1835	H	N							
Anthonomus stierlini Desbrochers des Loges, 1869	B								
Anthonomus ulmi DeGeer, 1775	H	X							
Bradybatus creutzeri Germar, 1823	H	X		N	N	X			
Bradybatus elongatulus (Boheman, 1843)	H				N				
Bradybatus kellneri Bach, 1845	H		N		N				
Cionellus gibbifrons (Kiesenwetter, 1852)	H								
Cionini Schönherr, 1825									
Cionus alauda (Herbst, 1784)								B	
Cionus balianii F. Solari, 1932						X			
Cionus colonnellii Košťál & Caldara, 2019	B								
Cionus hortulanus (Geoffroy, 1785)	H		N	N	N	X	X	B	
Cionus montanus Wingelmüller, 1914	X	N				X	X	B	
Cionus olens (Fabricius, 1792)	X		X			X		B	
Cionus olivieri Rosenschöld, 1838	H	X	X					B	
Cionus schoenherri C.N.F. Brisout de Barneville, 1863			X						
Cionus scrophulariae (Linnaeus, 1758)			X					B	
Cionus thapsus (Fabricius, 1792)	H	X		N		X	X	B	
Cionus tuberculosus (Scopoli, 1793)		X		N		X	X	B	
Cleopus solani (Fabricius, 1792)				N		X		N	
Stereonychus fraxini (DeGeer, 1775)	H	B							
Curculionini Latreille, 1802									
Archariina Pelsue & O'Brien, 2011									
Archarius crux (Fabricius, 1777)			N		N	X			

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Archarius pyrrhoceras (Marsham, 1802)	H	X		N	N	X	X		
Archarius salicivorus (Paykull, 1792)		X	X		N	X	X	N	
Curculionina Latreille, 1802									
Curculio elephas (Gyllenhal, 1835)	X								
Curculio glandium Marsham, 1802	H	X	X	N	N	X	X	B	
Curculio nucum Linnaeus, 1758	X			N		X			
Curculio pellitus (Boheman, 1843)	H			N		X	X		
Curculio propinquus (Desbrochers des Loges, 1868)	X		X						
Curculio villosus Fabricius, 1781	H			N		X			
Derelomini Lacordaire, 1865 **Derelomina** Lacordaire, 1865									
Derelomus chamaeropis (Fabricius, 1798)		X							
Ellescini C.G. Thomson, 1859 **Dorytomina** Bedel, 1886									
Dorytomus dejeani Faust, 1883	X	X				N	N		
Dorytomus filirostris (Gyllenhal, 1835)					N				
Dorytomus hirtipennis Bedel, 1884	X	X	X						
Dorytomus ictor (Herbst, 1795)	X	X	X		N	N		N	
Dorytomus longimanus (Forster, 1771)	N	X			N				
Dorytomus melanophthalmus (Paykull, 1792)			N	N		X			
Dorytomus minutus (Gyllenhal, 1835)		X							
Dorytomus nebulosus (Gyllenhal, 1835)					B				
Dorytomus rubrirostris (Gravenhorst, 1807)	N	X							
Dorytomus schoenherri schoenherri Faust, 1883		N							
Dorytomus suratus (Gyllenhal, 1835)		N		N					
Dorytomus taeniatus (Fabricius, 1781)	N	X		N	N	X	X	N	
Dorytomus tremulae (Fabricius, 1787)		X							
Dorytomus villosulus (Gyllenhal, 1835)		X							
Ellescina C.G. Thomson, 1859									
Ellescus scanicus (Paykull, 1792)		X							
Mecinini Gistel, 1848									
Cleopomiarus distinctus (Boheman, 1845)				B		X			
Cleopomiarus graminis (Gyllenhal, 1813)				N	N	X			
Cleopomiarus plantarum (Germar, 1823)	H	X	X		N	X	X		
Gymnetron aper Desbrochers des Loges, 1892	B			B					
Gymnetron niloticum Kirsch, 1881								B	
Gymnetron rostellum (Herbst, 1795)	H		X	N	B	X	X		
Gymnetron stimulosum (Germar, 1821)					B				
Gymnetron tibiellum Desbrochers des Loges, 1900			B						
Gymnetron veronicae (Germar, 1821)			X	B	B	X	X	B	
Gymnetron villosulum Gyllenhal, 1838			X					B	
Mecinus circulatus (Marsham, 1802)		X							
Mecinus comosus Boheman, 1845					B			B	
Mecinus haemorrhoidalis (H. Brisout de Barneville, 1862)	B				B	B		B	
Mecinus heydenii Wencker, 1866								B	
Mecinus ictericus (Gyllenhal, 1838)	X	X			N		B		
Mecinus janthinus (Germar, 1821)	H		X		N	X	X		
Mecinus kaemmereri Wagner, 1927 [E]								B	
Mecinus labilis (Herbst, 1795)	X		X		N				
Mecinus latiusculus (Jacquelin du Val, 1855)			N						
Mecinus pascuorum (Gyllenhal, 1813)	H	B	X		N	X	X	N	
Mecinus pyraster (Herbst, 1795)	H	X	X	N	N	X	X	N	

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Mecinus raphaelis Baviera & Caldara, 2014 [E]								B	
Mecinus simus (Mulsant & Rey, 1859)						B			
Mecinus variabilis (Rosenhauer, 1856)	H	X				N	X	B	
Miarus campanulae (Linnaeus, 1767)					N		X		
Rhinusa anthirrhini (Paykull, 1800)	H	X			N	X		B	
Rhinusa asellus (Gravenhorst, 1807)	X					X		B	
Rhinusa bipustulata (P. Rossi, 1792)	H	X	N	N	N	X	X	B	
Rhinusa comosa (Rosenschöld, 1838)	B					B	B	B	
Rhinusa herbarum (H. Brisout de Barneville, 1862)	H					X		B	
Rhinusa incana (Kirsch, 1881)								B	
Rhinusa neta (Germar, 1821)	H		X					B	
Rhinusa tetra (Fabricius, 1792)	X	X	X		N	X	X	B	
Rhamphini Rafinesque, 1815 **Rhamphina** Rafinesque, 1815									
Orchestes alni (Linnaeus, 1758)		X							
Orchestes betuleti (Panzer, 1795)		X							
Orchestes fagi fagi (Linnaeus, 1758)	H	X	X	N	N	X	X	B	
Orchestes jota (Fabricius, 1787)			X						
Orchestes pilosus (Fabricius, 1781)		X		N	N	X	X	N	
Orchestes quedenfeldti Gerhardt, 1865	H	B							
Orchestes quercus (Linnaeus, 1758)			X			N			
Orchestes subfasciatus (Gyllenhal, 1835)					N				
Pseudorchestes flavidus (H. Brisout de Barneville, 1865)	H								
Pseudorchestes pratensis (Germar, 1821)			X						
Pseudorchestes smrecynskii (Dieckmann, 1958)	B								
Rhamphus oxyacanthae (Marsham, 1802)		X	X	N	N	X			
Rhamphus pulicarius (Herbst, 1795)	H	N	X		N	N	X		
Rhamphus subaeneus Illiger, 1807	X								
Tachyerges decoratus (Germar, 1821)						X		N	
Tachyerges rufitarsis (Germar, 1821)					B				
Tachyerges salicis (Linnaeus, 1758)			X		N				
Tachyerges stigma (Germar, 1821)		X	X			X			
Smicronychini Seidlitz, 1891									
Aubeonymus carinicollis (P.H. Lucas, 1846)	H	X							
Pachytychius discithorax (Desbrochers des Loges, 1873)						X			
Pachytychius haematocephalus (Gyllenhal, 1835)	H	X	X					B	
Pachytychius hordei grandicollis (Waltl, 1835)	H				B			B	
Pachytychius sparsutus (A.G. Olivier, 1807)	X						X	B	
Smicronyx albosquamosus Wollaston, 1854		X							
Smicronyx coecus (Reich, 1797)						X			
Smicronyx cyaneus (Gyllenhal, 1835)	H	X					X	B	
Smicronyx italicus Voss, 1953 [E]					N				
Smicronyx jungermanniae (Reiche, 1797)	B				N			N	
Smicronyx menozzii F. Solari, 1952								N	
Smicronyx nebulosus Tournier, 1874		X				X	X		
Smicronyx reichi (Gyllenhal, 1835)	X	X				X			
Smicronyx syriacus Faust, 1887						X			
Styphlini Jekel, 1861									
Orthochaetes insignis (Aubé, 1863)	H								
Pseudostyphlus pilumnus (Gyllenhal, 1835)	B								
Styphlidius italicus G. Osella, 1981 [E]								B	
Tychiini C.G. Thomson, 1859 **Tychiina** C.G. Thomson, 1859									

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Sibinia arenariae Stephens, 1831		X							
Sibinia attalica Gyllenhal, 1835	H	X		B		X		B	
Sibinia femoralis Germar, 1823	X	X		N		X	X	B	
Sibinia pellucens (Scopoli, 1772)	H			B	N	X	X	B	
Sibinia viscariae (Linnaeus, 1760)	H						X	B	
Tychius amplicollis Aubé, 1850								B	
Tychius argentatus Chevrolat, 1859	X	X			N	N		B	
Tychius aureolus Kiesenwetter, 1852		X							
Tychius bicolor C.N.F. Brisout de Barneville, 1863	X	X		N	N	N	X		
Tychius breviusculus Desbrochers des Loges, 1873			X					N	
Tychius caldarai Dieckmann, 1986			X	B	B	X		N	
Tychius capucinus Boheman, 1843	X	X						B	
Tychius consputus Kiesenwetter, 1864	H			B	B				
Tychius cuprifer (Panzer, 1799)	X	X	X	N	N	X	X	B	
Tychius cupriferoides Ragusa, 1922		N	N				B		
Tychius curtirostris Desbrochers des Loges, 1873	X	X	X	N	N	X	X	B	
Tychius decretus Tournier, 1874		N						B	
Tychius depressus Desbrochers des Loges, 1873	X								
Tychius flavus Becker, 1864			X						
Tychius focarilei F. Solari, 1950 [E]						X			
Tychius grandicollis Desbrochers des Loges, 1873	X	X	X		B	X		N	
Tychius grenieri C.N.F. Brisout de Barneville, 1862	B								
Tychius junceus (Reich, 1797)	X		X			X			
Tychius kulzeri Penecke, 1934			X	N	N	X			
Tychius lineatulus Stephens, 1831	B							B	
Tychius longicollis C.N.F. Brisout de Barneville, 1863		X	X		N	N	X	N	
Tychius medicaginis C.N.F. Brisout de Barneville, 1863			X						
Tychius meliloti Stephens, 1831	X	X	N			N	X	B	
Tychius naxiae Faust, 1889		B				b			
Tychius picirostris (Fabricius, 1787)	X		X	N	N	X	X	N	
Tychius polylineatus (Germar, 1823)			X		N		X	B	
Tychius pusillus Germar, 1842	X	X	X	N	N	X		B	
Tychius quinquepunctatus (Linnaeus, 1758)	H	X			N	X	X		
Tychius rufipennis C.N.F. Brisout de Barneville, 1863	X			N			B		
Tychius schneideri (Herbst, 1795)	X	X			N	X	X		
Tychius squamulatus Gyllenhal, 1835	X	X	X		N		X		
Tychius stephensi Schönherr, 1835		X		N	N	X		B	
Tychius striatulus Gyllenhal, 1835			X						
Tychius thoracicus Boheman, 1843	X		X		B	X		B	
Tychius tibialis Boheman, 1843	X	X	X	N	N	X	X	B	
Cyclominae Schönherr, 1826 **Dichotrachelini** A. Hoffmann, 1957									
Dichotrachelus bensae A. Solari & F. Solari, 1904 [E]				B		X		B	
Hipporhinini Lacordaire, 1863									
Entomoderus deformis (Reiche & Saulcy, 1858)	H								
Entomoderus impressicollis peninsularis (F. Solari, 1940) [E]					N	X			
Gronops lunatus (Fabricius, 1775)							X		
Dryophthorinae Schönherr, 1825 **Dryophthorini** Schönherr, 1825									
Dryophthorus corticalis (Paykull, 1792)		B				X			NT
Rhynchophorini Schönherr, 1833 **Litosomina** Lacordaire, 1865									

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Sitophilus granarius (Linnaeus, 1758)					N				
Sitophilus oryzae (Linnaeus, 1763)	X	X			N	N	X	N	
Sitophilus zeamais Motschulsky, 1855						N		N	
Rhynchophorina Schönherr, 1833									
Rhynchophorus ferrugineus (A.G. Olivier, 1791)		N						N	
Sphenophorina Lacordaire, 1865									
Sphenophorus abbreviatus (Fabricius, 1787)	X	B							
Sphenophorus meridionalis Gyllenhal, 1838		B			N			B	
Sphenophorus parumpunctatus Gyllenhal, 1838					N			B	
Sphenophorus piceus (Pallas, 1771)	H	X							
Sphenophorus striatopunctatus (Goeze, 1777)	X								
Entiminae Schönherr, 1823									
Brachyderini Schönherr, 1826									
Brachyderes incanus (Linnaeus, 1758)							X	B	
Strophomorphus porcellus (Schönherr, 1832)	X	X			N	N	N	B	
Strophosoma erinaceus (Chevrolat, 1865)								B	
Strophosoma melanogrammus melanogrammus (Forster, 1771)				N		X	X	B	
Byrsopagini Lacordaire, 1863									
Graptus nictitans singularis (Jacquelin du Val, 1854)	H	X			N		X		
Rhytideres plicatus (A.G. Olivier, 1790)		B							
Tropiphorus imperator Pesarini, 1995 [E]					B	B			
Tropiphorus obtusus (Bonsdorff, 1785)						X			
Geonemini Gistel, 1848									
Barynotus obscurus (Fabricius, 1775)						X	X		
Barynotus solariorum Mainardi, 1907 [E]	X				N	X	X		
Myorhinini Marseul, 1863									
Haptomerus lepidus (Brullé, 1832)	H			CK	N		X		
Omiini Shuckard, 1840									
Elytrodon bidentatus Boheman, 1834	X								
Elytrodon italicus Pesarini, 1980 [E]					B				
Euplatinus graecus (Stierlin, 1884)								B	
Omias brancsiki (Reitter, 1906)	H								
Rhinomias forticornis (Boheman, 1842)						N			
Otiorhynchini Schönherr, 1826									
Cirrorhynchus pilipes (Leoni, 1907) [E]	H	X			B	X			
Cirrorhynchus sclanoi Abazzi & Magnano, 2003 [E]					B	B			
Dodecastichus brevipes tarentinus (A. Solari & F. Solari, 1915) [E]	B					X			
Dodecastichus consentaneus (Boheman, 1842)					CK	X			
Dodecastichus dalmatinus (Gyllenhal, 1834)								B	
Dodecastichus mastix (A.G. Olivier, 1807)	X				CK	X			
Dodecastichus ovoideus (Reitter, 1913) [E]	H								
Limatogaster colonnellii (Magnano, 1986) [E]					B	X			
Otiorhynchus abruzzensis Stierlin, 1893 [E]					B				
Otiorhynchus affaber Boheman, 1842	B	N		B				B	
Otiorhynchus alpicola Boheman, 1842				!	CH	X			
Otiorhynchus alutaceus alutaceus (Germar, 1817)						X	X		
Otiorhynchus alutaceus coarctaticornis A. Solari & F. Solari, 1907 [E]	H	X	B			B			
Otiorhynchus anthracinus (Scopoli, 1763)	X	X		N	CK	X	X	B	
Otiorhynchus apulus A. Solari & F. Solari, 1913 [E]	X							B	
Otiorhynchus armatus armatus Boheman, 1842		X		B	B	X	X	B	

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Otiorhynchus aurifer Boheman, 1842 [E]	H	X	X	N	N	N	X	!	
Otiorhynchus calabrensis Stierlin, 1891 [E]	X?						X	B	
Otiorhynchus calabrolucanus Lona, 1958						X			
Otiorhynchus corruptor corruptor (Host, 1790)						X	X	N	
Otiorhynchus crataegi Germar, 1823		B							
Otiorhynchus cribricollis Gyllenhal, 1834	X	X		N		X		!	
Otiorhynchus desertus Rosenhauer, 1847						X			
Otiorhynchus echidna K. Daniel & J. Daniel, 1898 [E]	H								
Otiorhynchus emanuelae Magrini, Meoli & Abbazzi, 2005 [E]					B				
Otiorhynchus fernandoi Magnano, 2001 [E]		B							
Otiorhynchus ferrarii Miller, 1863	X	N							
Otiorhynchus frescati Boheman, 1842			X						
Otiorhynchus garibaldinus A. Solari & F. Solari, 1909 [E]								B	
Otiorhynchus holdhausi A. Solari & F. Solari, 1913 [E]	H					B			
Otiorhynchus indefinitus Reitter, 1912	H			B	B	X	B	B	
Otiorhynchus juvencus juvencus Gyllenhal, 1834	X	X							
Otiorhynchus ligneoides Stierlin, 1902 [E]						X			
Otiorhynchus lubricus ausonius Pesarini, 1975 [E]								B	
Otiorhynchus lugens Germar, 1817	X	X	X	N	N	X	X	B	
Otiorhynchus lutosus Stierlin, 1858	B								
Otiorhynchus matutinus Reitter, 1912 [E]	X	X							
Otiorhynchus meridionalis Gyllenhal, 1834		CK			CK				
Otiorhynchus minutesquamosus A. Solari & F. Solari, 1909 [E]						X			
Otiorhynchus perdix (A.G. Olivier, 1807)	H			N	B	X			
Otiorhynchus pesarinii Diotti, 2008 [E]					B				
Otiorhynchus porcellus K. Daniel & J. Daniel, 1898 [E]						X			
Otiorhynchus rugosostriatus (Goeze, 1777)	H	B		N	N	X		CK	
Otiorhynchus scopularis Hochhuth, 1847				B	!		X		
Otiorhynchus setosulus Stierlin, 1861	X					X	X		
Otiorhynchus transadriaticus Reitter, 1913 [E]	H								
Otiorhynchus villosus Stierlin, 1872	B								
Otiorhynchus volturinensis Magnano, 1999 [E]	B				B				
Otiorhynchus vulturensis Lona, 1931 [E]				B					
Stomodes puncticollis amorei Desbrochers des Loges, 1904 [E]	H								
Peritelini Lacordaire, 1863									
Heteromeira margheritae Bellò & Pierotti, 1992 [E]		B				B			
Heteromeira marianii (Pesarini, 1972) [E]		X				B		B	
Heteromeira neapolitana (Faust, 1890) [E]	H			B	B				
Meira baudii Stierlin, 1892 [E]						B	B		
Meira oenotria Pierotti, 2013 [E]						B			
Meirella florentina (Stierlin, 1885)	CK								
Pseudomeira angelinii Pierotti, 2011 [E]								B	
Pseudomeira binaghii F. Solari, 1955 [E]						X		N	
Pseudomeira lucana Bellò & Pierotti, 1992 [E]		B			B	B			
Pseudomeira obscura (A. Solari & F. Solari, 1907)	B	B			B	X	X	B	
Pseudomeira paganettii (A. Solari & F. Solari, 1907) [E]								B	
Pseudomeira parvula (Seidlitz, 1865) [E]	H								
Pseudomeira pseudobscura Bellò & Pierotti, 1992 [E]					B	B	B		
Pseudomeira silvestrii (A. Solari & F. Solari, 1907) [E]								B	
Simo variegatus (Boheman, 1843) [E]						N			
Solariola angelinii Bellò, G. Osella & Baviera, 2019 [E]								B	
Solariola diottii Bellò, G. Osella & Baviera, 2019 [E]								B	
Solariola fancelloi Bellò, G. Osella & Baviera, 2019 [E]								B	

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Solariola fraterna Baviera, 2015 [E]								B	
Solariola hirtula A. Solari & F. Solari, 1923 [E]								B	
Solariola margaritae Bellò, G. Osella & Baviera, 2019 [E]								B	
Solariola pacei Bellò, G. Osella & Baviera, 2019 [E]								B	
Solariola paganettii (Flach, 1905) [E]								B	
Solariola pentaphyllica Bellò, G. Osella & Baviera, 2919 [E]								B	
Solariola poggii Bellò, G. Osella & Baviera, 2019 [E]								B	
Solariola tedeschii Bellò, G. Osella & Baviera, 2019 [E]							B	B	
Phyllobiini Schönherr, 1826									
Argoptochus schwarzi schwarzi (Reitter, 1888)	H				N	X	X	B	
Metacinops rhinomacer Kraatz, 1862				N	B	X	X	B	
Parascythopus baudii Stierlin, 1892 [E]						X			
Phyllobius argentatus argentatus (Linnaeus, 1758)				N	N	X	X	B	
Phyllobius chloropus (Linnaeus, 1758)		B							
Phyllobius emeryi Desbrochers des Loges, 1873 [E]					N				
Phyllobius etruscus Desbrochers des Loges, 1872	X		X	N	N		X	B	
Phyllobius italicus A. Solari & F. Solari, 1904 [E]			N	N	N	X	N	B	
Phyllobius longipilis Boheman, 1843 [E]	H			N	N	X	X	B	
Phyllobius maculicornis Germar, 1823	H			N	N	X	X	B	
Phyllobius oblongus (Linnaeus, 1758)	H	X	X	N	N	X	X	B	
Phyllobius pyri (Linnaeus, 1758)			X	B					
Phyllobius raverae A. Solari & F. Solari, 1904 [E]					N	X	X		
Phyllobius reicheidius Desbrochers des Loges, 1873 [E]							X	N	
Phyllobius romanus Faust, 1890 [E]	H			N	N	X	X		
Phyllobius subdentatus Boheman, 1842 [E]				N	N	X	X	B	
Phyllobius virideaeris pedestris Schilsky, 1911							X	B	
Pseudomyllocerus neapolitanus (Pic, 1902)		X		N	N	X	X	N	
Pseudomyllocerus sinuatus (Fabricius, 1801)	H	N			N		N		
Polydrusini Schönherr, 1823									
Auchmerestes kiesenwetteri Kraatz, 1862					N	X	X	N	
Liophloeus tessulatus (O.F. Müller, 1776)		X							
Polydrusus aeratus aeratus (Gravenhorst, 1807)					N	N		N	
Polydrusus amplicollis (Desbrochers des Loges, 1902) [E]	X				N	N			
Polydrusus armipes Brullé, 1832					N			B	
Polydrusus brevicollis Desbrochers des Loges, 1872	H	X	X	N	N	X	X		
Polydrusus calabricus (Faust, 1890)	X	X				N		B	
Polydrusus cervinus (Linnaeus, 1758)	H	X	X	N	N	X	X	B	
Polydrusus formosus (Mayer, 1779)				B			X		
Polydrusus frater Rottenberg, 1872	H	X	X	N	N	X	X	B	
Polydrusus impar Gozis, 1882	X				N	X	X	B	
Polydrusus kahri Kirsch, 1865		X				X	X	N	
Polydrusus lateralis Gyllenhal, 1834								N	
Polydrusus marginatus Stephens, 1831							X		
Polydrusus modestus (Stierlin, 1864)			N	N	N	X	X	B	
Polydrusus neapolitanus Desbrochers des Loges, 1872								B	
Polydrusus picus picus (Fabricius, 1792)	H						X		
Polydrusus pilosus italicus Schilsky, 1910 [E]	X	X			N	X	X	B	
Polydrusus pirazzolii Stierlin, 1857	H	N		N	N	X	X		
Polydrusus pterygomalis Boheman, 1840						X			
Polydrusus raverae A. Solari & F. Solari, 1904				B	N	X	X	B	
Polydrusus scutellaris (Chevrolat, 1860)	X			N	N	X	X		
Polydrusus siculus Desbrochers des Loges, 1872						X		B	
Polydrusus sparsus Gyllenhal, 1834	X	X	X	N	N	X	X	B	

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Polydrusus splendens A. Solari & F. Solari, 1909						N			
Polydrusus subnotatus Schilsky, 1910						X	X	B	
Polydrusus tibialis (Gyllenhal, 1834)	X	X	X		N		X		
Polydrusus viridicinctus Gyllenhal, 1834	X								
Psallidiini Lacordaire, 1863									
Mesagroicus amicalis Magnano, G. Osella & Abbazzi, 2008 [E]			X						
Sciaphilini Sharp, 1891									
Brachysomus hirtus (Boheman, 1845)	H			N	N	N	X	N	
Pleurodirus doderoi (D'Amore Fracassi, 1907)	H								
Sciaphobus abbreviatus (Desbrochers des Loges, 1871) [E]	X								
Sitonini Gistel, 1848									
Charagmus cachectus (Gyllenhal, 1834)	X	X							
Charagmus gressorius (Fabricius, 1792)	X					N	X	B	
Charagmus intermedius (Küster, 1847)			N			X	X	B	
Charagmus variegatus (Fåhraeus, 1840)	X	N					X		
Coelositona cambricus (Stephens, 1831)						X	X		
Coelositona cinerascens (Fåhraeus, 1840)						X			
Coelositona limosus (P. Rossi, 1792)	H	X				X	X		
Sitona callosus Gyllenhal, 1834	X					X	X	B	
Sitona cinnamomeus Allard, 1863				N					
Sitona cylindricollis cylindricollis Fåhraeus, 1840	X		X		N			N	
Sitona discoideus Gyllenhal, 1834	X	X		N	N	X		N	
Sitona gemellatus Gyllenhal, 1834	H							B	
Sitona goetzelmnni Reitter, 1909 [E]								B	
Sitona hirsutus Desbrochers des Loges, 1884							X		
Sitona hispidulus (Fabricius, 1777)			N	N		X		B	
Sitona humeralis Stephens, 1831	H	X	X	N	N	X	X	B	
Sitona lineatus (Linnaeus, 1758)	H	X	X	B	N	X	X	B	
Sitona lividipes lividipes Fåhraeus, 1840		X	X			X	X	B	
Sitona macularius macularius (Marsham, 1802)	H		X	N	N		N	B	
Sitona obsoletus obsoletus (Gmelin, 1790)							X	B	
Sitona ophthalmicus Desbrochers des Loges, 1869	H		N				X	B	
Sitona puncticollis Stephens, 1831	H		X	B		X	X	B	
Sitona sekerae Reitter, 1903 [E]	X						X		
Sitona sulcifrons argutulus Gyllenhal, 1834	H	X	X	B	N	X	X	B	
Sitona suturalis Stephens, 1831	X	X	X		N	X	X	B	
Sitona tenuis Rosenhauer, 1847		B			N	N		N	
Sitona verecundus (P. Rossi, 1790)	H				N				
Sitona waterhousei waterhousei Walton, 1846		X							
Tanymecini Lacordaire, 1863 **Tanymecina** Lacordaire, 1863									
Cycloderes canescens (P. Rossi, 1792)	B	B							
Cycloderes fritillum (Panzer, 1794)		X							
Cycloderes pominii F. Solari, 1954 [E]								B	
Tanymecus palliatus (Fabricius, 1787)		X					X	N	
Tanymecus submaculatus Chevrolat, 1860	X	X						B	
Trachyphloeini Gistel, 1848									
Cathormiocerus aristatus (Gyllenhal, 1827)							!		
Cathormiocerus discors Desbrochers des Loges, 1875								!	
Cathormiocerus hircus Desbrochers des Loges, 1896					!		!	!	
Cathormiocerus validiscapus Rouget, 1857					!				
Pelletierellus calabricus (Borovec, 1986)						B	X		

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Romualdius canaliculatus (L.W. Schaufuss, 1867)	X	X			B		B		
Romualdius peyerimhoffi (Formanek, 1910)	B								
Romualdius scaber (Linnaeus, 1758)						B	X		
Stuebenius amicalis (Borovec & G. Osella, 1993)				B	B		!		
Trachyphloeus alternans Gyllenhal, 1834	X					X	!	!	
Trachyphloeus laticollis Boheman, 1842	X				CK	X	X	B	
Trachyphloeus nodipennis Chevrolat, 1860			X						
Trachyphloeus spinimanus Germar, 1823	CK				CK	X		CK	
Hyperinae Marseul, 1863									
Hyperini Marseul, 1863									
Brachypera crinita (Boheman, 1834)	H	X			N	X		B	
Brachypera dauci (A.G. Olivier, 1807)								B	
Brachypera zoilus (Scopoli, 1763)	H	X			N	X	X	B	
Coniatus suavis Gyllenhal, 1834								B	
Coniatus tamarisci (Fabricius, 1787)	H	X			N			B	
Donus brucki (Capiomont, 1868) [E]						X	X		
Donus cyrtus (Germar, 1821)	X						X		
Donus fumanus (Petri, 1901)					N				
Donus philanthus (A.G. Olivier, 1807)	H	X				N		B	
Donus salviae (Schrank, 1789)	H				N	X	X	B	
Hypera arator (Linnaeus, 1758)	H								
Hypera conmaculata Herbst, 1795		X		B					
Hypera contaminata (Herbst, 1795)		X							
Hypera melancholica (Fabricius, 1792)	H					X	X	B	
Hypera meles (Fabricius, 1792)	H	X			N	N	X	N	
Hypera nigrirostris (Fabricius, 1775)	H	X	X	N	N	X	X	B	
Hypera pastinacae (P. Rossi, 1790)	H								
Hypera plantaginis (DeGeer, 1775)			N					B	
Hypera postica (Gyllenhal, 1813)	X	X	X	N	N	X	X	B	
Hypera rumicis (Linnaeus, 1758)			X						
Hypera striata (Boheman, 1834)	X						X		
Hypera venusta (Fabricius, 1781)	H	X	X			X	X	B	
Hypera viciae (Gyllenhal, 1813)	X								
Limobius borealis borealis (Paykull, 1792)	H	X	X	N	N	X		B	
Lixinae Schönherr, 1823									
Cleonini Schönherr, 1826									
Asproparthenis albicans (Gyllenhal, 1834)	X								
Asproparthenis maculicollis (Chevrolat, 1873)		B							
Bothynoderes affinis (Schrank, 1781)	X								
Cleonis pigra (Scopoli, 1763)	H	X	X		N	X	X	N	
Coniocleonus excoriatus (Gyllenhal, 1834)	X								
Coniocleonus megalographus (Fåhraeus, 1842)	X								
Coniocleonus nebulosus (Linnaeus, 1758)	!							B	
Coniocleonus nigrosuturatus (Goeze, 1777)	H								
Conorhynchus luigionii A. Solari & F. Solari, 1905	X	X							
Conorhynchus mendicus (Gyllenhal, 1834)	B	B							
Cyphocleonus testatus (Gyllenhal, 1834)	H								
Leucophyes pedestris (Poda von Neuhaus, 1761)	H								
Lixomorphus algirus (Linnaeus, 1758)	H	X	X			X	X		
Mecaspis alternans (Hellwig, 1795)	X	X				X	X	B	
Mecaspis emarginata (Fabricius, 1787)				B	!	X	!	B	
Pachycerus madidus (A.G. Olivier, 1807)		X							
Pachycerus segnis (Germar, 1823)	H	X			!	X	X		

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Pseudocleonus cinereus (Schrank, 1781)	H							B	
Pseudocleonus grammicus (Panzer, 1789)	X								
Pseudocleonus italicus F. Solari, 1950 [E]						X			
Rhabdorhynchus echii (Brahm, 1790)	H	X				!	B		
Temnorhinus mendicus (Gyllenhal, 1834)	X					!			
Trachydemus rugosus (P.H. Lucas, 1846)		B							
Lixini Schönherr, 1823									
Bangasternus orientalis (Capiomont, 1873)	H								
Larinus carinirostris Gyllenhal, 1835	H			B		X	X	B	
Larinus carlinae (A.G. Olivier, 1807)						X	X		
Larinus cynarae (Fabricius, 1787)	H	X			N	N		B	
Larinus iaceae (Fabricius, 1775)		X	N	B	N	X	X	B	
Larinus latus (Herbst, 1783)	H			B					
Larinus maurus (A.G. Olivier, 1807)	H								
Larinus obtusus Gyllenhal, 1835	H				N	X	X	B	
Larinus planus (Fabricius, 1792)	H	X	X	N		X	X	B	
Larinus pollinis (Laicharting, 1781)		B					X	B	
Larinus scolymi (A.G. Olivier, 1807)	H	X		B		X		B	
Larinus sturnus (Schaller, 1783)	X	X	X	N	N	X	X	B	
Larinus turbinatus Gyllenhal, 1835	X	X		B	N	X	X	N	
Larinus ursus (Fabricius, 1792)	H				N				
Larinus vulpes (A.G. Olivier, 1807)						X			
Lixus abdominalis Boheman, 1835	X	X		!		X	X	B	
Lixus acicularis Germar, 1823	H		X			X	X		
Lixus albomarginatus Boheman, 1842	!						X		
Lixus anguinus (Linnaeus, 1767)		X						B	
Lixus angustus (Herbst, 1795)		X	N	B	N	X	X	B	
Lixus ascanii (Linnaeus, 1767)	H			B		X	!	B	
Lixus bardanae (Fabricius, 1787)	!	N	X		!		X		
Lixus cardui A.G. Olivier, 1807	H	X	X	N	N	X	X	N	
Lixus cinerascens Schönherr, 1832	X	N			N	N			
Lixus curvirostris Capiomont, 1875	X					X			
Lixus cylindrus (Fabricius, 1781)		X							
Lixus fasciculatus Boheman, 1835	H	X				X	X	B	
Lixus filiformis (Fabricius, 1781)	N	N	X	N	N		!	N	
Lixus iridis A.G. Olivier, 1807	H	X	X	N	!	X	X	B	
Lixus juncii Boheman, 1835	X	X		B	!		!	B	
Lixus lateralis (Panzer, 1789)						X			
Lixus mucronatus (A.G. Olivier, 1791)			X						
Lixus myagri A.G. Olivier, 1807	H					X			
Lixus ochraceus Boheman, 1842							X		
Lixus paraplecticus (Linnaeus, 1758)								B	
Lixus pulverulentus (Scopoli, 1763)	X	X			!		!	B	
Lixus scolopax Boheman, 1835	H	X							
Lixus tibialis Boheman, 1842						B			
Lixus umbellatarum (Fabricius, 1787)	H			B					
Lixus vilis (P. Rossi, 1790)	X	X		N			X	B	
Microlarinus lareynii (Jacquelin du Val, 1853)	X	B							
Rhinocyllus conicus (Frölich, 1792)	X	X	X	N	N	X	X	B	
Mesoptiliinae Lacordaire, 1863									
Magdalidini Pascoe, 1870									
Magdalis armigera (Geoffroy, 1785)	H	X			N		X		
Magdalis barbicornis (Latreille, 1804)	H				N	X			

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Magdalis cerasi (Linnaeus, 1758)	H	X	X	N	N	X	X	N	
Magdalis exarata C.N.F. Brisout de Barneville, 1862	H				N	X	X	N	
Magdalis flavicornis (Gyllenhal, 1836)							X	N	
Magdalis frontalis (Gyllenhal, 1827)		X		N		X	X		
Magdalis memnonia (Gyllenhal, 1837)						X	X	B	
Magdalis nitidipennis Boheman, 1843		X	X		N			N	
Magdalis rufa Germar, 1823	X							B	
Magdalis ruficornis (Linnaeus, 1758)								N	
Magdalis scutellaris K. Daniel, 1903	X								
Magdalis violacea (Linnaeus, 1758)							X		
Molytinae Schönherr, 1823 **Cryptorhynchini** Schönherr, 1825 **Cryptorhynchina** Schönherr, 1825									
Cryptorhynchus lapathi (Linnaeus, 1758)		B			N				LC
Tylodina Lacordaire, 1865									
Acalles camelus (Fabricius, 1792)	X	X		N	N	X	X	B	LC
Acalles lemur cisalpinus Stüben, 2003 [E]	X			N	N	X	X		NT
Acalles papei A. Solari & F. Solari, 1905					!				LC
Acalles parvulus Boheman, 1837	N	B		N	N	X	N	N	LC
Acallocrates denticollis (Germar, 1823)	H	!			N	N			LC
Acallocrates minutesquamosus (Reiche, 1861)		X		N	N	X	X	B	LC
Acallorneuma reitteri Mainardi, 1906 [E]						N			NT
Coloracalles humerosus (Fairmaire, 1862)	N								VU
Dichromacalles diocletianus (Germar, 1817)		X				!		N	
Dichromacalles dromedarius (Boheman, 1844)								N	
Dichromacalles rolletii (Germar, 1839)								B	NT
Echinodera aspromontensis Stüben, 2008 [E]	!	!		N	B	B	N	B	
Echinodera bellieri (Reiche, 1861)	X	X			B	B	X	B	NT
Echinodera brisouti brisouti Reitter, 1885	H	X		N	B	N		B	LC
Echinodera hypocrita (Boheman, 1837)	H	N			N	X	X	N	LC
Echinodera siciliensis Stüben, 2003 [E]	N								NT
Echinodera variegata (Boheman, 1837)	X	B				X	X	B	NT
Elliptacalles longus (Desbrochers des Loges, 1892)					N	N		B	NT
Kyklioacalles aubei (Boheman, 1837)	H	X		N	N	X	X	N	LC
Kyklioacalles fausti (P. Meyer, 1896)		B				X			LC
Kyklioacalles navieresi (Boheman, 1837)	N				N	N			LC
Kyklioacalles roboris (Curtis, 1834)	X			N	N	N			LC
Kyklioacalles saccoi (Colonnelli, 1973) [E]						X	!		NT
Kyklioacalles solarii (A. Fiori, 1903) [E]		X			N	B		B	LC
Onyxacalles luigionii (A. Solari & F. Solari, 1907)	X				N	X		!	LC
Ithyporini Lacordaire, 1865									
Camptorhinus simplex Seidlitz, 1867			X		!				LC
Camptorhinus statua (P. Rossi, 1790)	X	X			N	X	X		LC
Lepyrini Kirby, 1837									
Lepyrus palustris palustris (Scopoli, 1763)	X	X			N				
Molytini Schönherr, 1823 **Hylobiina** Kirby, 1837									
Hylobius abietis (Linnaeus, 1758)					N	X	X	B	LC
Hylobius transversovittatus (Goeze, 1777)		B							LC
Molytina Schönherr, 1823									
Anisorhynchus barbarus (Boheman, 1834)							X	CK	
Anisorhynchus monachus monachus (Germar, 1817)	H	X			CK		CK	CK	

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Leiosoma baudii Bedel, 1884	H				CK	X	CK		
Leiosoma colonnellii Pedroni, 2012 [E]					B	B			
Leiosoma oblongulum Boheman, 1842						X	X		
Liparus coronatus (Goeze, 1777)						X			
Liparus germanus (Linnaeus, 1758)								B	
Liparus interruptus Magnano, 1955 [E]						B			
Plinthina Lacordaire, 1863									
Hoplopteridius lutosus calaber G. Osella & Lodos, 1979 [E]								B	
Minyops carinatus (Linnaeus, 1767)						B		CK	
Minyops scrobiculatus Gyllenhal, 1834 [E]								B	
Mitoplinthus pubescens (Petri, 1896)								B	
Neoplinthus tigratus porculus (Fabricius, 1801)	X								
Neoplinthus tigratus tigratus (P. Rossi, 1792) [E]	B				N	X		CK	
Plinthus illigeri colonnellii Meregalli, 1985 [E]						X		B	
Plinthus megerlei (Panzer, 1802)					B	X			
Plinthus squalidus granulipennis Fairmaire, 1852	X			B	CK	X		B	
Pissodini Gistel, 1848									
Pissodina Gistel, 1848									
Pissodes castaneus (DeGeer, 1775)	B			N		X	X	B	LC
Pissodes piceae (Illiger, 1807)					N	X	X	B	LC
Pissodes validirostris (C.R. Sahlberg, 1834)						X	X		LC
Torneumatini Bedel, 1884									
Torneuma deplanatum deplanatum (Hampe, 1864)	B	X			N			B	
Torneuma grouvellei grouvellei Desbrochers des Loges, 1890								N	
Typoderini Voss, 1965									
Aparopion chevrolati (Jacquelin du Val, 1855)	H	X			B	B	X	B	
Aparopion suturidens Reitter, 1891	X	X		B	B	B	X	B	
Platypodinae Shuckard, 1840									
Platypodini Shuckard, 1840									
Platypus cylindrus (Fabricius, 1792)	H	X					X	N	LC
Treptoplatypus oxyurus (Dufour, 1843)						B		N	
Scolytinae Latreille, 1804									
Corthylini LeConte, 1876									
Pityophthorina Eichhoff, 1878									
Pityophthorus glabratus Eichhoff, 1878							X		LC
Pityophthorus lichtensteinii (Ratzeburg, 1837)						X			LC
Pityophthorus pityographus pityographus (Ratzeburg, 1837)								B	LC
Pityophthorus pubescens (Marsham, 1802)			X					B	LC
Cryphalini Lindemann, 1877									
Cryphalus asperatus (Gyllenhal, 1813)									LC
Ernoporicus fagi (Fabricius, 1798)						X	X		LC
Crypturgini LeConte, 1876									
Crypturgus cinereus (Herbst, 1793)							X		LC
Crypturgus numidicus Ferrari, 1867	X	X							LC
Crypturgus pusillus (Gyllenhal, 1813)						X		N	LC
Dryocoetini Lindemann, 1877									
Coccotrypes dactyliperda (Fabricius, 1801)								B	
Dactylotrypes longicollis (Wollaston, 1864)								B	
Dryocoetes villosus villosus (Fabricius, 1792)						N			LC
Taphrorhychus bicolor (Herbst, 1793)	X	X		N		X	X	N	LC
Taphrorhychus villifrons (Dufour, 1843)	H								LC
Thamnurgus euphorbiae (Handschuch, 1845)	H								LC

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Xylocleptes bispinus (Duftschmid, 1825)	H		X	N		X		N	LC
Hylastini LeConte, 1876									
Hylastes angustatus (Herbst, 1763				N		X	X	N	LC
Hylastes attenuatus Erichson, 1836							X		LC
Hylastes pinicola (Bedel, 1888)							X		LC
Hylurgops palliatus (Gyllenhal, 1813)							X	N	LC
Hylesinini Erichson, 1836									
Hylesinus crenatus (Fabricius, 1787)		X							LC
Hylesinus taranio (Danthoine, 1788)		X				N			LC
Hylesinus varius (Fabricius, 1775)	X	X				N			
Kissophagus novaki Reitter, 1894		X	X						LC
Kissophagus vicinus (Comolli, 1837)		N							LC
Hylurgini Gistel, 1848									
Chaetoptelius vestitus (Mulsant & Rey, 1861)		X							LC
Hylurgus ligniperda (Fabricius, 1787)							X		LC
Hylurgus micklitzi Wachtl, 1881	X								LC
Tomicus minor (Hartig, 1834)							X	B	LC
Tomicus piniperda (Linnaeus, 1758)							X	B	LC
Hypoborini Nüsslin, 1911									
Hypoborus ficus Erichson, 1836	X	X				N		N	LC
Ipini Bedel, 1888									
Ips acuminatus (Gyllenhal, 1827)						X			LC
Ips sexdentatus (Boerner, 1776)				N		X	X	N	LC
Ips typographus (Linnaeus, 1758)							X	N	LC
Orthotomicus erosus (Wollaston, 1857)	X	X				N			LC
Orthotomicus laricis (Fabricius, 1792)		X		N		X	X		LC
Orthotomicus proximus (Eichhoff, 1868)	B								LC
Orthotomicus suturalis (Gyllenhal, 1827)						X			LC
Pityogenes bidentatus (Herbst, 1783)						X	X		LC
Pityogenes bistridentatus (Eichhoff, 1878)	B?					X	X	N	LC
Pityogenes calcaratus (Eichhoff, 1878)	B						X		LC
Pityogenes chalcographus (Linnaeus, 1760)	X								LC
Pityogenes trepanatus (Nördlinger, 1848)						X			LC
Pityokteines curvidens (Germar, 1824)						X			LC
Phloeosinini Nüsslin, 1912									
Phloeosinus thujae (Perris, 1855)	X								LC
Phloeotribini Chapuis, 1869									
Phloeotribus cristatus (Fauvel, 1889)							X		LC
Phloeotribus rhododactylus (Marsham, 1802)		N							LC
Phloeotribus scarabaeoides (Bernard, 1788)		X						N	LC
Polygraphini Chapuis, 1869									
Carphoborus pini Eichhoff, 1881	X								LC
Polygraphus grandiclava C.G. Thomson, 1886						X		N	LC
Scolytini Latreille, 1804									
Scolytus amygdali Guérin-Méneville, 1847	X					N		N	LC
Scolytus ensifer Eichhoff, 1881		X							VU
Scolytus intricatus (Ratzeburg, 1837)							X		LC
Scolytus kirschii kirschii Skalitzky, 1876		X							LC
Scolytus multistriatus (Marsham, 1802)	X	X		N	B	N	X	N	LC
Scolytus pygmaeus (Fabricius, 1787)		X							LC
Scolytus rugulosus (P.W.J. Müller, 1818)	H	X				X	X		LC
Scolytus sulcifrons Rey, 1892		N			B				LC

Species	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	IUCN category
Xyleborini LeConte, 1876									
Anisandrus dispar (Fabricius, 1792)	X								LC
Xyleborinus saxesenii (Ratzeburg, 1837)	H	X	X	N				N	LC
Xyleborus dryographus (Ratzeburg, 1837)	H	N							LC
Xyleborus eurygraphus (Ratzeburg, 1837)								B	LC
Xyleborus monographus (Fabricius, 1792)	H		X			X	X		LC
Xyloterini LeConte, 1876									
Trypodendron domesticus (Linnaeus, 1758)		N				X	X		LC
Trypodendron lineatumsa (A.G. Olivier, 1800)						X			LC
Trypodendron signatus (Fabricius, 1792)						X			LC
Curculionidae taxa incertae sedis									
Absoloniella servadeii (G. Osella, 1982) [E]	B								

CONCLUSIONS

The latest author's research as well as the data available in literature have greatly increased the number of known species in the surveyed areas. The situation that emerges is summarized in following Table 2.

The presence of saproxylic species in the study sites is rather cospicuous; in fact, they amount to 56.1% of the overall saproxylic species known for Italy. However, this figure should not be misleading, since the last column of following Table 3 shows that the "Critically endangered" (CR) species make up just 25.9% of the total on Italy and the "Endangered" species (EN) and "Vulnerable" (VU) account for 27% and 40% respectively.

It can be deduced that the level of research, especially in some of the areas, is not yet sufficiently exhaustive and that the sites subject of the survey suffer from a considerable degree of anthropization or incorrect management of wooded areas, so that the entomofauna of special conservation interest proves to be, to some extent, impoverished. In many recent papers on saproxylic fauna the need to maintain a certain amount of dead wood in the forests is underlined, a good practice that unfortunately is often not applied.

According to the fifty-year experience of the author researching Coleoptera, it would be necessary to establish integral nature reserves in ancient woodland as well as regulating livestock grazing in grasslands that are increasingly depleted.

It is considered useful and necessary, mainly in the perspective of future research, to comment on the data presented here despite the fact that it is difficult to separate the mere judgment based on sterile numbers from personal sentiment, because these are places that the author investigated for more than four decades (starting from distant 1968) witnessing too many changes, often irreversible, with consequent progressive decline of the fauna.

Particularly, from an examination of the data summarized in Tables 2 and 4, it clearly emerges that only the Coleoptera fauna of Policoro Wood can be considered sufficiently studied. With its 2,353 species collected in an area of just 680 hectares, this site is perhaps one of those that show greater biodiversity throughout the Mediterranean basin. The reasons are many: it is an ancient floodplain forest with a quite varied and dense vegetation so that it preserves a certain microclimate and, although today reduced to a very small portion of those forests that once covered the entire Metapontino, for this same reason it represents a last exiguous shelter for all those forest dwelling species that have undergone the inexorable erosion of their habitat; it is also placed in a favorable position at the mouth of Sinni river which, especially before the construction of the Monte Cotugno dam, during the floods washed downstream huge quantities of debris, and with them species, from inland; last but not least, studies here have been conducted extensively by researchers of several disciplines.

Site	Species in Angelini's catalogues (1986-1996)	New data by Angelini + in literature + in CKmap	Total species known to date
Gargano Promontory	2,291	301	2,592
Policoro Wood	1,823	530	2,353
Pantano Lake of Pignola	992	259	1,251
Mount Vulture-Monticchio Lakes	-	1,427	1,427
Central Lucan Apennines	-	2,315	2,315
Pollino Massif	1,824	931	2,755
Sila Plateau	1,741	350	2,091
Aspromonte	-	2,715	2,715

Table 2. The increase in number of known species, from the publication of the catalogues on Coleoptera in the 1980s–1990s to the present.

IUCN Category	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	Total	Italy total	%
CR	4	8		5	8	9	3	6	21	81	25.9
EN	10	15	2	3	11	14	15	8	33	122	27.0
VU	31	31	1	7	31	55	36	38	86	215	40.0
NT	80	64	12	20	69	92	77	90	191	348	54.9
LC	395	393	122	243	368	484	372	415	708	977	72.5
DD	25	26	11	8	26	23	14	36	74	240	30.8
NA		1						1	2	-	-
Total	545	538	148	286	513	677	517	594	1,115	1,986	56.1

Table 3. Number of saproxylic species in each of the surveyed areas, compared to the total and percentage for Italy (CR: Critically Endangered; EN: Endangered; VU: Vulnerable; NT: Nearly Threatened; LC: Least Concern; DD: Data Deficient; NA: Not Applicable).

Even the Coleoptera fauna of Pantano Lake of Pignola can be considered sufficiently known taking into account the features and limited extent of this site, as evidenced by the high number of species typical of meadow areas and of lakes shores that it shows.

In the district of Mount Vulture-Monticchio Lakes, despite the relatively small size, the number of species surveyed is probably less than the expected total considering the peculiar characteristics of the biotope.

Gargano Promontory, although explored at length by several researchers and given the variety of environments and the extension, records a number of species (2,591) decidedly lower than a realistic estimation. It can be assumed that especially the fauna of the coasts, where saved by the tourist encroachment and pressure, should still reveal many novelties.

Fauna of Central Lucan Apennines, known for over 2/3 on the basis of published or unpublished personal data, could prove to be more abundant, as shown by particularly targeted research conducted by other entomologists in the Gallipoli-Cognato woods.

Faunal total of Pollino Massif, in the light of the many and often interdisciplinary researches it has been subjected to and the fact that most of the data comes from territories located over 1,000 meters above sea level, can be considered sufficiently investigated and close to the real one.

As far as Sila Plateau is concerned, the data possessed or deduced from bibliography are decidedly incomplete; it is to be regarded as the site whose fauna is less well known, especially that of the soil, as will be discussed later about Staphylinidae.

The Aspromonte, curiously, shows a species number almost similar to that of Gargano Promontory with which it shares, broadly, also the territorial extension, despite having been less investigated. And like Gargano Promontory, it is believed that the currently known fauna of Aspromonte, based for 1/3 on mostly previously unpublished personal data, is partially incomplete and that more data may emerge from research aimed at the study mainly of floricolous species both of mountainous areas and of the shorelines least damaged by human impact.

A numerical analisys of the presence of the various families in each of the sites (Table 4) confirms and amplifies what has been remarked above. Taking into account the 12 families represented by over 100 species in this study, the following observations can be made:

- Ptinidae (103 species): in Pollino Massif, Policoro Wood, Aspromonte and Gargano Promontory the number of species varies between 47–54 (equal to approximately 50% of the treated species); the 27 and 34 species recorded for Mount Vulture-Monticchio Lakes and Central Lucan Apennines are believed not to fully represent the actual presence of this family in these areas, while the low number of species known for Pantano Lake of Pignola is to be attributed to the particular features of the site.
- Nitidulidae (113 species): represented on average by 51–68 species, the high and significant number of species known for Pollino Massif (87, that is 77% of total) stands out, while the 30 species known for Mount Vulture-Monticchio Lakes are to be considered heavily underestimated; regarding this family it should however be noted that 7,500 specimens collected by the author are still undetermined.
- Elateridae (117 species): represented on average with about 53–63 species, the positive peak of 77 species for Pollino Massif should be noted while the lesser total of 22 for the Pantano Lake of Pignola is largely imputable to the particular characteristics of the site; Sila Plateau and Aspromonte confirm that they have a similar trend (75 and 72 species respectively).
- Brentidae (sensu lato) (134 species): it is interesting to note how Gargano Promontory, Pollino Massif and Aspromonte are settled on 76–80 species while Policoro Wood has a strange smaller peak of 47 species, similar to that of Central Lucan Apennines. The number of species known for Pantano Lake of Pignola is significant, 52 species, reflecting the high biodiversity of this site regarding the floricolous fauna, a situation also found for other families not discussed here (Coccinellidae).
- Buprestidae (135 species): in this family a high number of known species is recorded for Pollino Massif (96, equal to 71.1% of the total) and Policoro Wood (95); the other sites have 70–77 species while the small number of Pantano Lake of Pignola stands out, 21 species collected only in meadows surrounding the lake, given the almost total absence of trees nearby.
- Tenebrionidae (147 species): family whose species have a remarkably diversified ecology, not by chance for Aspromonte, Gargano Promontory and Policoro Wood, therefore sites that include shorelines, 77–90 species are known (90 for the first site) while Central Lucan Apennines, Pollino Massif and Sila Plateau stand on 48–61 species; the lesser total of just 20 species of Pantano Lake of Pignola is due to its peculiar geomorphological characteristics.
- Scarabaeidae (169 species): the average number in most sites (five) varies between 87 and 99 species; the primacy of known species belongs to Aspromonte (120) and the negative one to Pantano Lake of Pignola (just 29).

Family	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	Red List of saproxylic	Total
Sphaeriusidae		1								1
Gyrinidae	5	8	3	4	6	4	4	5		9
Rhysodidae	2	1		2	3	2	1	2	3	3
Carabidae	233	253	109	172	224	220	201	278		475
Haliplidae	8	9	3	4	6	5	5	5		9
Noteridae	1	2	1	1	1	1	2	1		2
Hygrobiidae	1	1			1	1				1
Dytiscidae	40	49	23	16	52	45	44	54		89
Hydrophilidae	24	40	26	18	19	30	30	34		65
Helophoridae	12	12	6	7	4	13	9	6		18
Hydrochidae	1	2	1	1	1	3	2	1		3
Georissidae		2			1	2		3		3
Histeridae	73	51	11	29	62	55	51	54	26	98
Hydraenidae	15	11	9	6	21	20	18	27		53
Ptiliidae	19	18	11	12	20	17	11	27	28	45
Agyrtidae						1		1		1
Leiodidae	40	30	17	31	47	50	32	44	24	75
Silphidae	6	8	4	5	6	10	9	8		13
Staphylinidae	368	319	222	198	396	400	230	431	96	853
Geotrupidae	7	5	3	5	5	6	6	7		11
Trogidae	1	2			1	1		1		2
Lucanidae	3	5	1	4	5	5	5	4	6	6
Ochodaeidae		2								2
Hybosoridae		1	1					1		1
Scarabaeidae	97	87	29	68	88	99	90	120	14	169
Eucinetidae		1	1			1	2	2		2
Clambidae	5	7	4	3	3	7	3	5	12	12
Scirtidae	4	8	5	6	9	8	7	8	1	18
Dascillidae	1				1	1	1	1		1
Buprestidae	70	95	21	39	77	96	74	72	96	135
Byrrhidae	2	1	1		2	5	3	2	1	9
Elmidae			1	2	5	9	8	8		12
Dryopidae	2	7	3	3	3	4	4	5		12
Limnichidae	1	4	3	1	2	4		3		4
Heteroceridae	5	6	2	3	5	6	2	4		7
Artematopodidae					1					1
Eucnemidae	2	2		1	1	4	5	5	8	8
Throscidae	1	4	7	1	7	4	3	6	11	12
Lycidae	3	2		2	2	4	5	5	5	5
Lampyridae	2	2	2		2	3	3	2		5
Cantharidae	35	21	12	28	30	58	40	40		77
Omalisidae		2			1					2
Elateridae	62	53	22	39	63	77	75	72	36	117
Derodontidae		1			1	1			1	1
Nosodendridae					1				1	1
Dermestidae	22	20	9	11	12	26	18	12	11	42
Bostrichidae	9	11	5	4	8	7	6	12	17	18

Table 4/1. Number of species, per family, in each of the sites, in the Italian Red List of saproxylic Coleoptera and total.

Family	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	Red List of saproxylic	Total
Ptinidae	47	53	10	27	34	54	30	50	65	103
Lymexylidae	1				1	1	1	2	2	2
Byturidae	1					2	1			2
Biphyllidae	2	3		1	2	3	2	2	3	3
Peltidae						2	2	2	2	2
Lophocateridae						1		1	1	1
Trogossitidae	3	2		2	2	2	2	3	3	3
Thymalidae						1	1	1	1	1
Rhadalidae	2	3		1	6	3	3	6	8	11
Melyridae	41	32	22	30	41	52	37	45	17	77
Cleridae	13	12	6	7	14	15	10	13	12	20
Sphindidae	2	3		1	1	2	1	2	3	3
Erotylidae	8	8		5	5	11	7	6	14	15
Monotomidae	8	8	5	5	5	6	4	5	13	13
Kateretidae	6	4		2	2	4	5	3		9
Nitidulidae	56	45	32	30	45	87	51	68	26	113
Cryptophagidae	31	31	22	15	36	32	20	39	30	68
Silvanidae	7	7	6	4	4	5	2	7	2	8
Cucujidae	1		1		1	3	4	2	4	4
Phalacridae	11	11	11	9	14	17	10	12		23
Laemophloeidae	7	9	2	2	5	7	4	5	7	9
Cybocephalidae		1				1		1		1
Bothrideridae	1				2	1	1	1	2	2
Teredidae	3	2		1	2	2		3	2	3
Cerylonidae	5	4	1	3	6	5	4	4	6	6
Latridiidae	24	30	23	15	30	27	19	38	42	55
Alexiidae	3			3	4	4	2	5	5	5
Corylophidae	7	10	6	3	6	12	4	9	7	18
Anamorphidae	1	1	1	2	1	3		2	3	3
Endomychidae	10	13	1	4	7	11	5	15	5	19
Mycetaeidae	1				1	1	1	1	1	1
Coccinellidae	44	42	44	28	34	41	42	41		77
Mycetophagidae	8	9	3	6	7	8	8	9	12	13
Ciidae	12	16	4	9	11	23	9	11	27	30
Tetratomidae					1		1	2	2	2
Melandryidae	3	2		1	2	7	7	8	10	10
Mordellidae	21	16	2	1	4	23	14	2	1	35
Ripiphoridae	1	1			1			2		2
Zopheridae	11	9	3	8	14	14	10	13	20	20
Tenebrionidae	78	77	20	30	48	61	58	90	49	147
Prostomidae						1			1	1
Oedemeridae	14	16	8	13	19	18	16	18	11	23
Meloidae	20	11	6	9	13	15	19	20		27
Mycteridae	3	2	1	1	1	2	2			3
Pyrochroidae	1	1	1	1	2	2	2	2	3	3
Salpingidae	3	3	3	1	3	5	3	6	7	7
Anthicidae	26	33	16	10	15	22	17	30		48

Table 4/2. Number of species, per family, in each of the sites, in the Italian Red List of saproxylic Coleoptera and total.

Family	Gargano Promontory	Policoro Wood	Pantano Lake of Pignola	M. Vulture Monticchio L.	Central Lucan Apennines	Pollino Massif	Sila Plateau	Aspromonte	Red List of saproxylic	Total
Aderidae	3	1	2		2	1	3	3	4	5
Scraptiidae	18	17	3	6	5	15	12	8	8	25
Vesperidae	1	1	1		1	1	1	1		1
Cerambycidae	107	84	25	73	105	120	101	89	150	181
Megalopodidae						1				1
Orsodacnidae	1		1	1	1	1	1	1		1
Chrysomelidae	237	181	161	107	210	223	176	205		427
Nemonychidae						1				1
Anthribidae	11	10	4	4	6	8	5	8	13	15
Attelabidae	23	12	7	17	23	20	17	19		30
Brentidae	80	47	52	44	47	80	66	76	1	134
Curculionidae	382	304	157	159	258	350	259	320	113	750
Totals	2,592	2,353	1,251	1,427	2,315	2,755	2,091	2,715	1,115	5,130

Table 4/3. Number of species, per family, in each of the sites, in the Italian Red List of saproxylic Coleoptera and total.

- Cerambycidae (181 species): the numerical dynamics of this family that accounts for the greatest quantity of saproxylic species is particularly important and significant; while Pollino Massif shows up for the greater number of species (120), Pantano Lake of Pignola is confirmed as having the least diverse fauna with just 25 species; indicative is the clear difference, generally not perceptible, between the fauna of Gargano Promontory and that of Aspromonte, 107 and 89 species respectively, while strangely Policoro Wood with 84 species places itself below Sila Plateau and Central Lucan Apennines which count, respectively, 101 and 105.

- Chrysomelidae (427 species): Gargano Promontory with 237 species has the highest expression of biodiversity, while the discrepancy between Pollino Massif (223 species) and Aspromonte (205) validates what has already been said regarding the further research needed on the latter. Sila Plateau as well, with just 176 species (181 for Policoro Wood), confirms how little this area has been investigated. Mount Vulture-Monticchio Lakes with 107 species require further in-depth research, while Pantano Lake of Pignola with 161 species corroborate a high biodiversity for the species linked to the meadows.

- Carabidae (475 species): Aspromonte (278 species) is the significantly richest area, while four sites follow with a number of species ranging between 201 (Sila) and 233 (Gargano); Policoro Wood, despite its small size, with 253 known species far exceeds the remaining sites.

- Curculionidae (750 species): it is perhaps the only case in which Gargano Promontory shows the greatest richness with 382 species and reaffirms the contrast already noted with Aspromonte which counts only 320; Sila Plateau and Central Lucan Apennines stand respectively on 259 and 258 species, while Pantano Lake of Pignola and Mount Vulture-Monticchio Lakes have only 157 and 159 species; the Pollino Massif with 350 species sees its high biodiversity confirmed.

- Staphylinidae (853 species): particularly interesting and enlightening for future research and to understand the current state of the same is the analysis of the presence of this important family, mainly linked to the soil: Aspromonte stands out with 431 species that is 201 more than the nearby Sila Plateau (which would be the last, if not for the much smaller sites of Pantano Lake of Pignola and Mount Vulture-Monticchio Lakes); Gargano Promontory, Central Lucan Apennines and Pollino Massif vary between 368 and 400 species, while Policoro Wood, despite its small surface area, numbers 319 species; it should however be emphasized that the writer's contribution to the knowledge of this family was much lower than for other families, as 17,000 collected specimens are still unidentified.

On the basis of what has just been explained, it can be concluded that the research on the floricolous and saproxylic beetles of Aspromonte should be further increased, and that the fauna of the soil is still to be investigated more widely and in more detail, mainly in the Sila Plateau and Gargano Promontory. Policoro Wood and the Pollino Massif show a state of knowledge that can be considered acceptable, while Mount Vulture-Monticchio Lakes are further to be studied at a general level.

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Policy recommendation on whaling, trade and watching of cetaceans (Mammalia Cetacea) in the Republic of Korea

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ABSTRACT Most of the cetacean (Mammalia Cetacea) species are endangered due to various past human activities and most of these species are still under threat due to the same reason. We recommend the development of policies regarding whaling, trading and watching of cetaceans in the Republic of Korea. We recommend the restriction of trade in marine mammals, whether for human consumption or for entertainment purposes, and the development and adoption of ethical rules for marine mammal watching activities.

KEY WORDS Policy recommendation; conservation; cetacean; Republic of Korea.

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INTRODUCTION

Most cetacean species are under threat, as a result of past human actions (Brito et al., 2017; Hofman, 2017), and although measures were taken, a number of species is still declining (Avila et al., 2018). As a measure for whale protection, parties of the International Whaling Commission (IWC) voluntarily ratified a moratorium banning commercial whaling in 1986 but allowed special exceptions in the case of scientific research. Additionally, whales are also listed under the Appendix 1 of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES Appendix 1). Despite a few countries not adhering to the moratorium of the IWC, several governments have found it too lax and reinforced the legal protection for whales. For instance, importing wild-caught cetaceans is banned in Finland since 2003, and in Mexico since 2006 (Ordorica, 2003; Mexico Wildlife Law, 2006; Alaniz, 2008). Since 2007, dolphins originating from Taiji, Japan are banned in the Dominican Republic (WDC, 2007), and since 2012 marine mammals cannot be kept for entertainment purpose in Switzerland (Swiss Parliament, 2012). The Republic of Korea has also reinforced the guidelines of the IWC moratorium, although these additional laws do not prevent illegal whaling practices through by-catch and whale meat trade (Choi, 2018; Park, 2018), nor the consideration of beginning whaling for "scientific research" (Kang, 2012) . Here, we suggest a reinforcement of policies for live trade, meat trade, husbandry, consumption, and tourism in the frame of integrated cetacean conservation.

DISCUSSION

Trade and breeding of live animals

Dolphins have been used for entertainment purposes in the Republic of Korea since 1984 (Nam, 2017a). From then on, Bottlenose Dolphins (*Tur-*

siops sp.) used in the industry originate principally from Japan, while Indo-Pacific Bottlenose Dolphins, *Tursiops aduncus* (Ehrenberg, 1833), are locally caught, and Belugas are imported from Russia (Lee, 2017). As of October 2019, a total of 38 cetaceans were held captive in eight aquariums in the Republic of Korea (Hotpinkdolphins, 2019). The last specimens imported were two Bottlenose Dolphins in January 2017, accommodated at the Jangseong-po Whale Museum and Whale Experience Hall, Ulsan, and one of the two specimens died within five days of arrival (Nam, 2017b). Because of negative popular press, and in response to the death, several Korean NGOs created the "Cetacean Captive Facility Report". This report highlights that the average life expectancy for captive cetaceans in Korea is 4 years, compared to 40 to 50 years in the wild (Lee, 2017). As a result, the Korean Ministry of Environment banned both the importation of live cetaceans captured from Taiji, Japan, and "*erroneously captured*" individuals (Ministry of Environment, 2018). However, importation from other localities is still legal, without the quantitative assessment of captures, or the definition of legal conditions of capture. Finally, the current cetacean breeding program still lacks strict regulation.

In view of the information presented above and under the current situation, we recommend a ban on the import of any marine mammal for entertainment purposes, especially for species requiring high housing standards in captivity. It is also essential to update the laws on this topic and improve the quality of the farms of all the specimens still in captivity.

Meat trade and consumption

Whale and dolphin meat is readily available along the south-eastern coast of the Korean peninsula (Kang & Phipps, 2000), allegedly originating from legal catch and by-catch (Mills et al. 1997). It is affecting cetacean populations in the waters exploited by the Republic of Korea and nearly resulted in a local extirpation. The population size of Finless Porpoises, *Neophocaena asiaeorientalis* (G. Cuvier, 1809), dropped from an estimated population size of 36,000 individuals to 13,000 between 2004 and 2011, with an additional 7,869 individuals killed between 2011 and 2016 (Heo, 2017). As a result, the Finless Porpoise was designated as a Marine Protected Species on 29 September 2016, legally forbidding trade from 2017 (Ministry of Ocean and Fisheries, 2016). However, 792 cases of by-catch were reported in 2018 (Ministry of Ocean and Fisheries, 2019), a number estimated to be between 5000 and 7000 individuals by official dolphin meat traders (Lee, 2019a).

In addition, evidence shows a mismatch between whale meat reported as by-catch and the amount offered for sale. This is the result of illegal whale meat entering the market (Baker et al. 2006; Baker et al. 2010). For instance, over 700kg of whale meat disguised as shark meat entered the country in 2018 (Kim 2018). Also, more than 53 marine mammals were illegal caught, by an estimated 30 illegal whaling vessels in Korean waters, and traded between 2014 and 2018 (Lee 2019b).

The consumption of the cetacean meat maintain a demand, pressuring both illegal and legal whale and dolphin meat trade. Consequently, we recommend banning the sale of all cetacean meat to eliminate any sales of disguised illegal by-catch of species that cannot be legally hunted, and alleviate hunting pressure on legally hunted species.

Tourism

Marine mammal watching is a recognised profitable industry, with very clear benefits for education and thus conservation when conducted appropriately (Foxlee, 2001; Lück, 2003; Mayes et al., 2004). However, tourism based on marine mammal watching is often conducted without strict guidelines, which can have a stronger direct negative impact than the positive output of education (Parsons, 2012). For instance, surveying research vessels reduce time spent foraging at the surface by Sperm Whales (Isojunno & Miller, 2015); boats within a 1 km radius result in decreased communication in Bottlenose Dolphins (Luís et al., 2014); the sound produced by boats is correlated with the production of stress hormones in Right Whales (Rolland et al., 2012), and boat traffic from dolphin watching affects the amount of rest time available to Bottlenose Dolphins (Constantine et al., 2004). Finally, the presence of boats has been found to be related to the cause of death to one-third of stranded cetaceans in the Canary Islands (Arbelo et al., 2013) and to the decrease in breeding output in Gray

Whales, where as little as 10 days of lost foraging opportunities due to disturbance can result in an unsuccessful pregnancy or the loss of a calf (Villegas-Amtmann et al., 2015). Cetacean watching programs are being developed on Jeju Island and have been present in Ulsan for a few years.

In this case, a ban on cetacean observation should not be proposed because the development of this practice can have invaluable educational and conservation results. However, the establishment of stricter rules, respecting the life of cetaceans, would be desirable. Adopting a better marine mammal observation policy can protect these populations from negative anthropogenic effects, both in the Republic of Korea and in other countries.

CONCLUSIONS

Based on the data presented above and on the critical survival situation of some cetacean species, we recommend the development of new and better policies for the conservation of marine mammals present in the territorial waters of the Republic of Korea.

In this case, all governmental and ministerial branches dealing with the environment, culture, tourism and fishing should be concerned with more frequent and efficient controls and rapid sanctions appropriate to the seriousness of the violations carried out.

These regulations and their application must be shared with all other countries that have the same problems to ensure greater protection for cetaceans worldwide.

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New distribution record of *Elysia leucolegnote* (Jensen, 1990) (Sacoglossa Plakobranchidae) in mangrove ecosystem of Biak Numfor, Papua - Indonesia

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ABSTRACT

Elysia leucolegnote (Jensen, 1990) (Sacoglossa Plakobranchidae) was firstly found in Hong Kong and described in 1989. Furthermore, in the past decade, the mangrove leaf-slug, *E. leucolegnote*, has been found outside Hong Kong, for example in Thailand, India, and Australia, but it is here reported for the first time in Indonesia. Details on the distribution, habitat and external morphology of *E. leucolegnote* in Biak Numfor, Papua, Indonesia, are here described. This species is found in mangrove ecosystems and has a similar morphological external character with previously reported which are distributed worldwide from East, South and Southeast Asia to Australia. The IUCN redlist category is discussed in this paper.

KEY WORDS Distribution; Gastropoda; Eastern Indonesia; Leaf-slug; Mangrove ecosystem.

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INTRODUCTION

The order Sacoglossa inhabits brackish and marine waters worldwide (Jensen, 2007; Yonow, 2008). The Indo-Polynesian region is an area that has a high number of species and distribution of Sacoglossa, but few areas have been extensively sampled (Jensen, 2007). Furthermore, the genus *Elysia* Risso, 1818 (Plakobranchidae) of the Sacoglossa order in the Indo-Pacific region have 65 species (Jensen, 1992). To the family Plakobranchidae belongs generally small species of heterobranch sea slugs (formerly known as Opisthobranchia); it is also the largest family of Sacoglossa (Yonow, 2008).

In general, all sacoglossans, including the genus *Elysia*, are herbivores (Jensen, 1997) with algae as a food source (Jensen, 1993; 1994). They are usually less than 1 cm in size (Swennen, 2011; Bourke et al., 2016) and only a few species occur in the mangrove ecosystem (Jensen, 1996; Swennen, 2011; Bourke et al., 2016). Their external morphology includes a slender head, dorsal rhinophores, eyes, wing-like parapodia, anus located behind the rhinophores, and oral tentacles are absent (Jensen, 1992; Jensen, 1996). Many species have symbiotic algal chloroplasts (Jensen, 1997; Wägele & Johnsen, 2001). Their body coloration varies according to their food sources (Jesus et al., 2010; Costa et al., 2012). *Elysia leucolegnote* (Jensen, 1990) has been found in the last 2 decades but appears to have a patchy distribution (Swennen, 2011). The genus *Elysia* has not been reported in Indonesia before, furthermore the aim of this study is to report on the external morphology, distribution, habitat for the first time in Indonesia and IUCN red list categories of *E. leucolegnote*.

MATERIALS AND METHODS

The study was conducted in the Biak Barat mangrove ecosystem (1°0'33,715" N and 135°48' 54.83" E), Biak Numfor District, Papua, Indonesia in August 2015 (Fig. 1). The mangrove trees found at the study site were *Avicennia* sp., *Bruguiera* sp., *Rhizophora* sp., and *Sonneratia* sp. The sampling was conducted with a survey around the mangrove root. The specimens found were 3 individuals, furthermore photographed in situ and image J was used to measure the external morphology (Figs. 2–5). The identification of *E. leucolegnote* was according to Swennen (2011).

RESULTS AND DISCUSSION

The specimens of *E. leucolegnote* had a total length of 0.6 cm to 1.8 cm (n=3), the average length of rhinophores was 0.03 cm, a white triangle in the head extending to the rhinophores (Fig. 2), yellowish green on the head and body, white bands along the parapodia both sides and colored spots (Fig. 3) of varying sizes. One specimen of *E. leucolegnote* was missing one rhinophore and some had damage of the edges of the parapodia (Fig. 4). Specimens of *E. leucolegnote* were found at depths of 5 to 7 cm (Fig. 5), located among the *Rhizophora* sp. Roots with 100% water clearness and mud substrate (Fig. 2). Based on IUCN red categories, species of *E. leucolegnote* is data deficient.

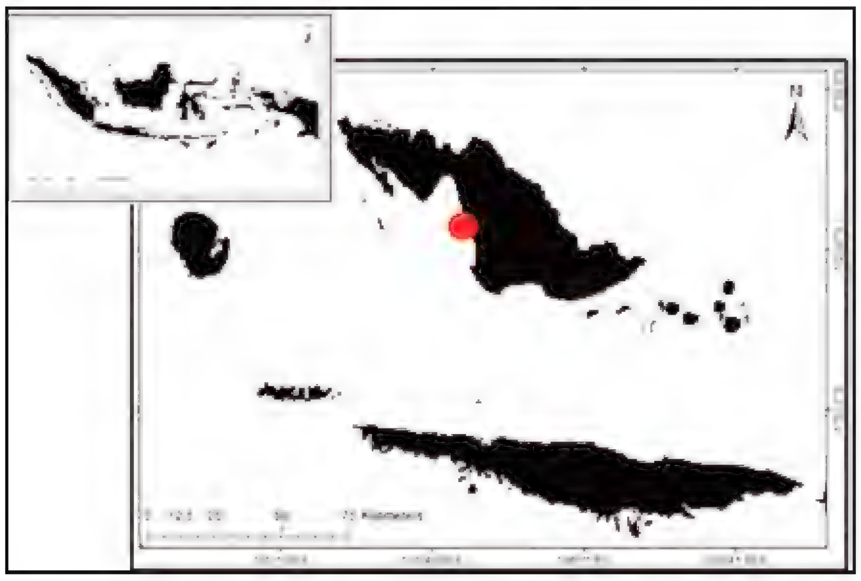
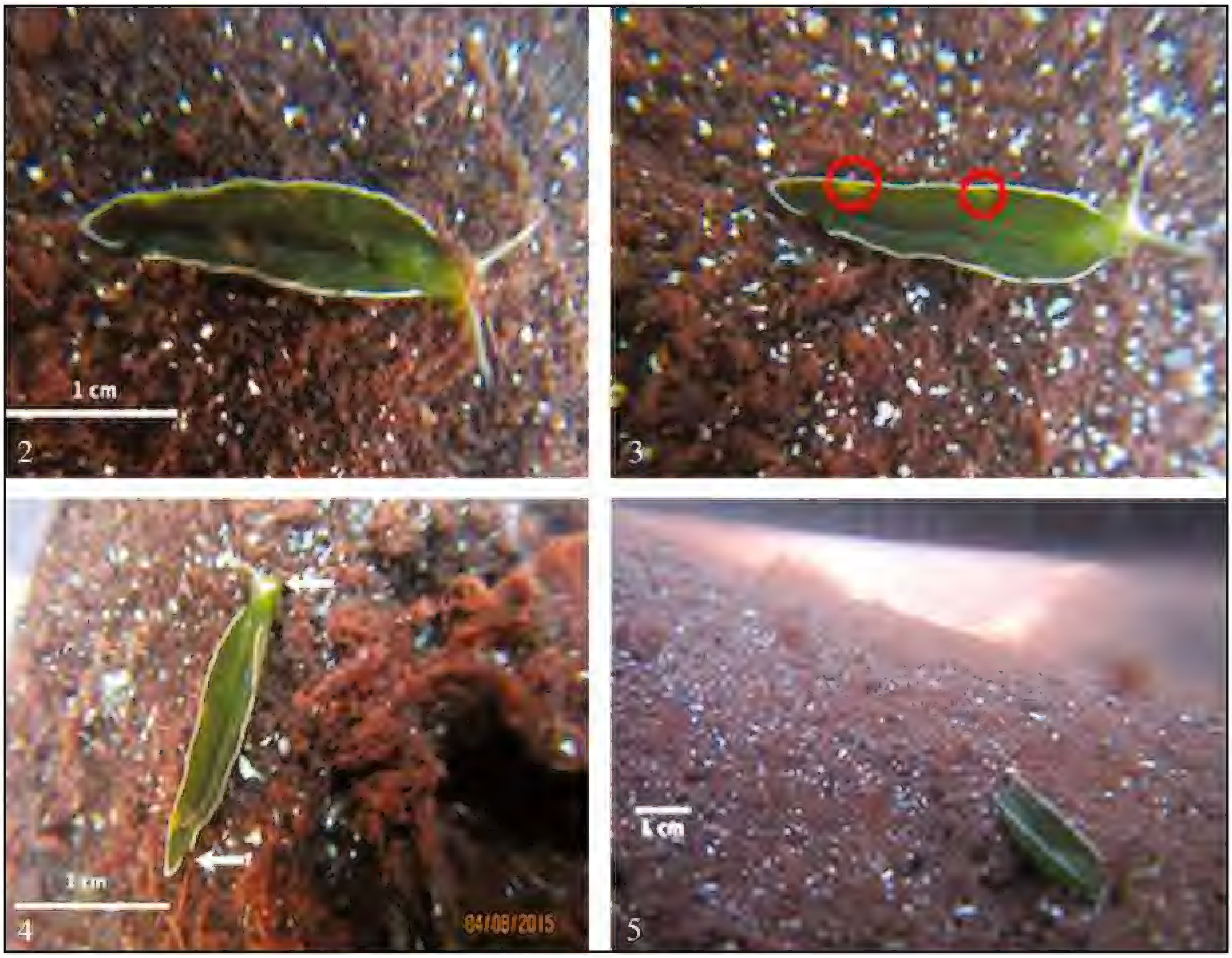


Figure 1. Map showing the study site (red circle).

The specimens of *E. leucolegnote* found in this study is longer compared to most previous studies in which specimens were more than 1 cm, but had similar characteristics, namely rhinophores and a white triangle on the head, yellowish green color on the head and body, white bands along the parapodia both sides (Jensen, 1990; Swennen, 2011; Sreeraj et al., 2012; Bourke et al., 2016). Mostly of species from the genus *Elysia* have bands on parapodia and colored spots of varying sizes on the body (Jensen, 1992). Specimens with damage in the parapodia of *E. leucolegnote* were also found in this study. The damage consisted of smaller or larger parts missing, or some had a hole in parapodia, which may have caused by crab or bird and will heal totally after feeding (Swennen, 2011).

Previous studies showed that *E. leucolegnote* were found in the mangrove ecosystem (Jensen, 1990; Swennen, 2011; Bourke et al., 2016) with clear waters, under mangrove roots and mud substrate (Swennen, 2011; Bourke et al., 2016). Furthermore, *E. leucolegnote* can be found at low tide, anaerobic water conditions with white colonies and borders of sulphur bacteria (Swennen, 2011). This species was often found solitary in the mangrove ecosystem substrate. According to Swennen (2011), at the lowest tide, *E. leucolegnote* will aggregate in small ponds containing water.

Elysia leucolegnote was originally found initially in Hong Kong (Jensen, 1990), then in Thailand and Singapore (Swennen, 2011), Andaman Island, India (Sreeraj et al., 2012), Australia (Bourke et al., 2016), and Indonesia (present study) (Fig. 6). The distribution of *E. leucolegnote* now includes the tropics of West Pacific and East Indian Ocean, as well as eastern Indonesia and northern Australia. Swennen (2011) predicted that *E. leucolegnote* would be distributed worldwide from East, South and Southeast Asia to Australia (Fig. 6).



Figures 2–5. External character morphology and habitat of *E. leucolegnote* found in a mangrove ecosystem of Biak Numfor District, Papua, Indonesia.

The morphology, adaptation and evolution genus of *Elysia* has been known by previous studies (Jensen, 1990; 1992; 1993; 1994; 1996; 1997) but data on distribution are lacking, as in IUCN red list category this species is data deficient (IUCN, 2012). This category indicates that more information is needed about the distribution and abundance of this species and habitat, especially in Indonesia. Furthermore, the habitat of *E. leucolegnote* can be commonly found in mangrove ecosystems (Swennen, 2011; Bourke et al., 2016) and Indonesia is a country that has the largest distribution of mangrove ecosystems in the world (Polidoro et al., 2010). Since mangrove ecosystems have declined in decades due to over-exploitation (Polidoro et al., 2010), the impact will directly decline the number of *E. leucolegnote* in nature. Therefore, in order to prevent the extinction of this species in nature, we need to protect the mangrove ecosystem.

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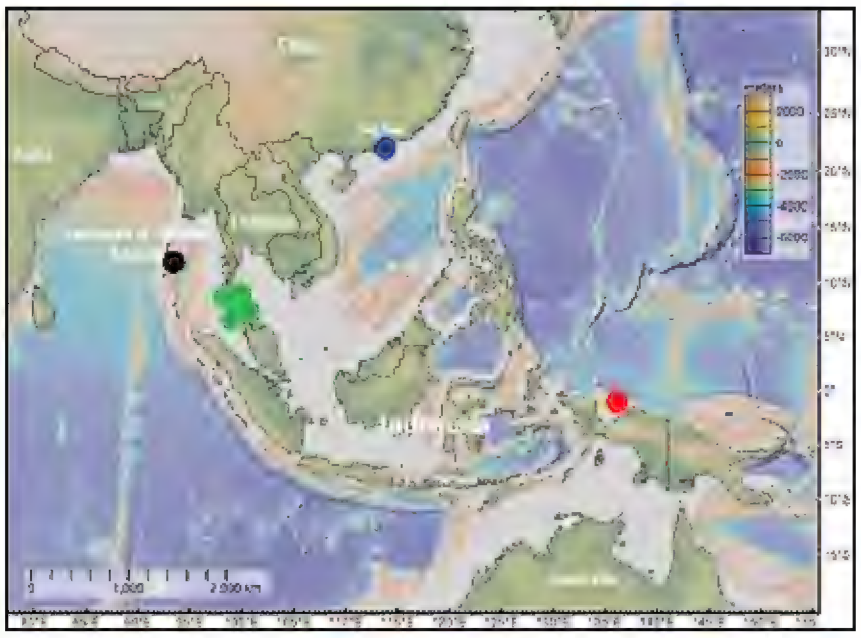

Figure 6. Map showing distribution of *Elysia leucolegnote* (blue, black, green, and white circles from Jensen (1990), Sreeraj et al. (2012), Swennen (2011), Bourke et al. (2016), respectively, and red for this study).

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Revision of the genus *Heterobrissus* (Echinoidea), with a new species from Sardinia, and redefinition of *Heterobrissus niasicus* (Doderlein, 1901) in *Echinopneustes* n. gen.

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ABSTRACT Morphological characters previously unknown in *Heterobrissus montesi* Manzoni et Mazzetti, 1878, the type-species of the genus *Heterobrissus* Manzoni et Mazzetti, 1878, such as the oral plate structure and the position of the periproct, are herein described based on topo-typic material from the Middle Miocene of the Northern Apennines (Italy). Similar, well preserved specimens from the Early Miocene of Sardinia are attributed to *Heterobrissus lubellii* n. sp., which differs from *H. montesi* by its longer and wider petals and the peristome farther from the anterior margin of the test. The new available data confirm also that the genus *Archaeopneustes* Gregory, 1892 is junior synonym with *Heterobrissus*. Unreported specimens from the Late Oligocene of Alicante (Spain) enable to illustrate the plastron structure and other so far unknown features in *Pygospatangus salvae* Cotteau, 1890, the type species of the genus *Pygospatangus* Cotteau, 1890, and indicates that *Pygospatangus* is a junior synonym with *Heterobrissus*. *Heterobrissus salvae* differs from *H. montesi* mainly by its thicker shell and longer plates in the proximal part of the oral ambulacra I and V. The Recent species *Heterobrissus niasicus* (Döderlein, 1901), *H. erinaceus* Baker et Rowe, 1990 and *H. gigas* Baker et Rowe, 1990, from the Indo-Pacific, are herein transferred to *Echinopneustes* n. gen. *Echinopneustes* differs from *Heterobrissus* mainly by the labrum extending only to the adjoining ambulacral plate 2, not to plate 3 as in *Heterobrissus*, by the periproct being marginal, not inframarginal as in *Heterobrissus*, and bounded by the fifth plates in the interambulacrum 5, not by the fourth. The distribution of *Heterobrissus*, so far known from the Burdigalian of Sardinia, the Langhian of Northern Italy and the Serravallian of Cyprus, is extended to the Late Oligocene of Spain and to the Recent, with *H. hystrix* (Agassiz, 1880), today living in the Carribbean area. The functional morphology of the test, supported by actualistic comparison and by data taken from sedimentary settings and the associated taxa, indicates that *Heterobrissus* was an epibenthic feeder, preferring muddy outer shelf environments with tropical climate.

KEY WORDS Echinoidea; *Heterobrissus*; Oligo-Miocene; Mediterranean; *Echinopneustes* n. gen.

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INTRODUCTION

Heterobrissus montesi Manzoni et Mazzetti, 1878, the type-species of the genus *Heterobrissus* Manzoni & Mazzetti, 1878, was described on the basis of a single poorly preserved specimen from the Langhian Pantano Formation of Montese, near Modena (Northern Italy). This species was subsequently recorded in the same Formation from a number of other localities in the Northern Apennines (Manzoni, 1879, 1880; Mazzetti, 1881; Stefanini, 1908), and from the Early Burdigalian Nurallao formation of Isili, Sardinia (Stara et al., 2012). *Heterobrissus formai* Airaghi, 1901 and *H. cypriotes* Currie, 1935 were instituted on the basis of fossil material from the Langhian of Piedmont (Northern Italy) and the Serravallian of Cyprus, respectively. *Heterobrissus cypriotes* was subsequently considered as a junior synonym with the type-species by Smith & Gale (2009). Four Recent species are currently attributed (Baker & Rowe, 1990; Smith & Kroh, 2011) to the genus *Heterobrissus*: *H. niasicus* (Doderlein, 1901), *H. hemingi* (Anderson in Alcock, 1902), *H. gigas* Baker et Rowe, 1990 and *H. erinaceus* Baker et Rowe, 1990; all of them inhabit deep muddy bottoms in the Indo-Pacific. The genus *Archaeopneustes* Gregory, 1892 was originally distinguished from *Heterobrissus* by the position of the periproct and by the extension of the labrum (Mortensen, 1950), characters which prior to this study were unclear in *H. montesi*, due to the poor preservation of the available fossil material. According to Smith & Kroh (2011) and Kroh & Mooi (2019), *Archaeopneustes hystrix* (Agassiz, 1880), today living in the Caribbean area, could belong to *Heterobrissus*. Also *Pygospatangus* Cotteau, 1890, from the ?Eocene and the Late Oligocene of Spain, is considered as a possible junior synonym with *Heterobrissus* by Smith & Kroh (2011).

The uncertainty about the relationships existing between these genera was a result of the poor preservation of the holotype of *H. montesi*, which missed the oral face (Manzoni & Mazzetti, 1878, p. 354-355, fig. 2), and of the other specimens from the type-area subsequently described by Manzoni (1879, 1880) and Stefanini (1908). Also, the preservation of the holotype of *Pygospatangus salvae* is too poor (Cotteau, 1890, p. 17-18, pl. 14, fig. 1-3) to make any detail about the apical disc, the structure of the plastron, the peristome and tuberculation, so that the true affinities of this taxon cannot, so far, be determined (Smith & Kroh, 2011).

The aim of this paper was to complete the description of the diagnostic characters of the genus *Heterobrissus*, based on the re-examination of the original fossil material studied by Manzoni (1879, 1890) and Stefanini (1908) and on the study of unreported topotypic specimens from Emilia-Romagna and of well preserved specimens recently collected from the Early Miocene of Sardinia. The relationships between *Heterobrissus* and the closely related genera have been discussed using unreported specimens from the Oligocene of Alicante (Spain) and Recent specimens of *H. niasicus*, with emphasis on the oral plate structure, a morphological character of major relevance in the systematic of spatangoids.

MATERIAL AND METHODS

Study area

The newly reported material of *H. montesi* was collected in the Langhian Pantano Formation from 6 different localities of the Emilia-Romagna Region (Northern Apennines; Fig. 1): Montese (the type-locality), Pescale, Zocca and Guiglia (Province of Modena), Monte Valestra (Reggio Emilia) and Jano near Sasso Marconi (Bologna). The holotype, a poorly preserved specimen, is missing at the Museo di Paleobiologia, University of Modena (MPUM), where the Mazzetti's collection is housed. Specimen numbers prefixed IGF are housed at the Museo di Storia Naturale, Sezione di Geologia e Paleontologia, University of Firenze. They consist of 12 specimens studied by Stefanini (1908) and 5 specimens collected by one of the authors (E.B.). None of the specimens figured in Manzoni (1979) has been traced at the IGF; two specimens illustrated in Stefanini (1908: pl. 14 figs. 4a,b, missing the oral face, and pl. 14, fig. 5, missing the aboral face) are available to study. The oral plating scheme has been taken from IGF.100335 (Jano) and IGF.101266.

Thirty-seven specimens of *Heterobrissus* collected by one of the authors (P.S.) from the Early Miocene of Sardinia (Arbus, Isili, Nureci and Genoni) were examined at the Museo di Storia Naturale "Aquilegia" of Masullas (MAC) and at the Museo di Paleontologia e Geologia Domenico Lovisato, University of Cagliari (MDLCA); thirty of them from the Early Burdigalian of the Nurallao formation of Isili (MDLCA.23788, MDLCA. 23789, MDLCA.23790, MDLCA 23792, MAC.PL1509, PL1847, PL1860-70, PL2097, PL2165-73), four from the Burdigalian-Early Langhian Marne di Gesturi formation of the Nureci-Genoni area (MAC.PL2871-3, MDLCA 23791), two from the same formation of Genoni (MAC.PL2095-6), one (MAC.PL2163) from the Late Oligocene-Early Aquitanian of Calada Bianca, near Funtanazza.

The holotype of *H. formai* Airaghi, 1901 is wanting at the Museo Regionale di Storia Naturale of Torino (MTPL); the observations reported by Stefanini (1908), who examined that specimen, have been utilised in the discussion.

The holotype of *Pygospatangus salvae* is housed at the Muséum National d'Histoire Naturelle, Paris (MNHN, repository code R62327). Ten specimens from the Oligocene (Late Chattian) of Xorret de Catì and Sierra de Monteagudo, near Novelda, Alicante (Spain), were examined in five private Spanish collections: Leonardo Hernandez (LH.01, 04), Clifford Saint Clair (CP.01-03) and Jose Carlos Saldaña (JS.01-02) from Alicante, Carlos Garcia (CG.01-02) from Madrid and Manuel Adel Alegre (MA.01) from Vinaròs. One of these specimens (CG.02) retains a number of primary spines.

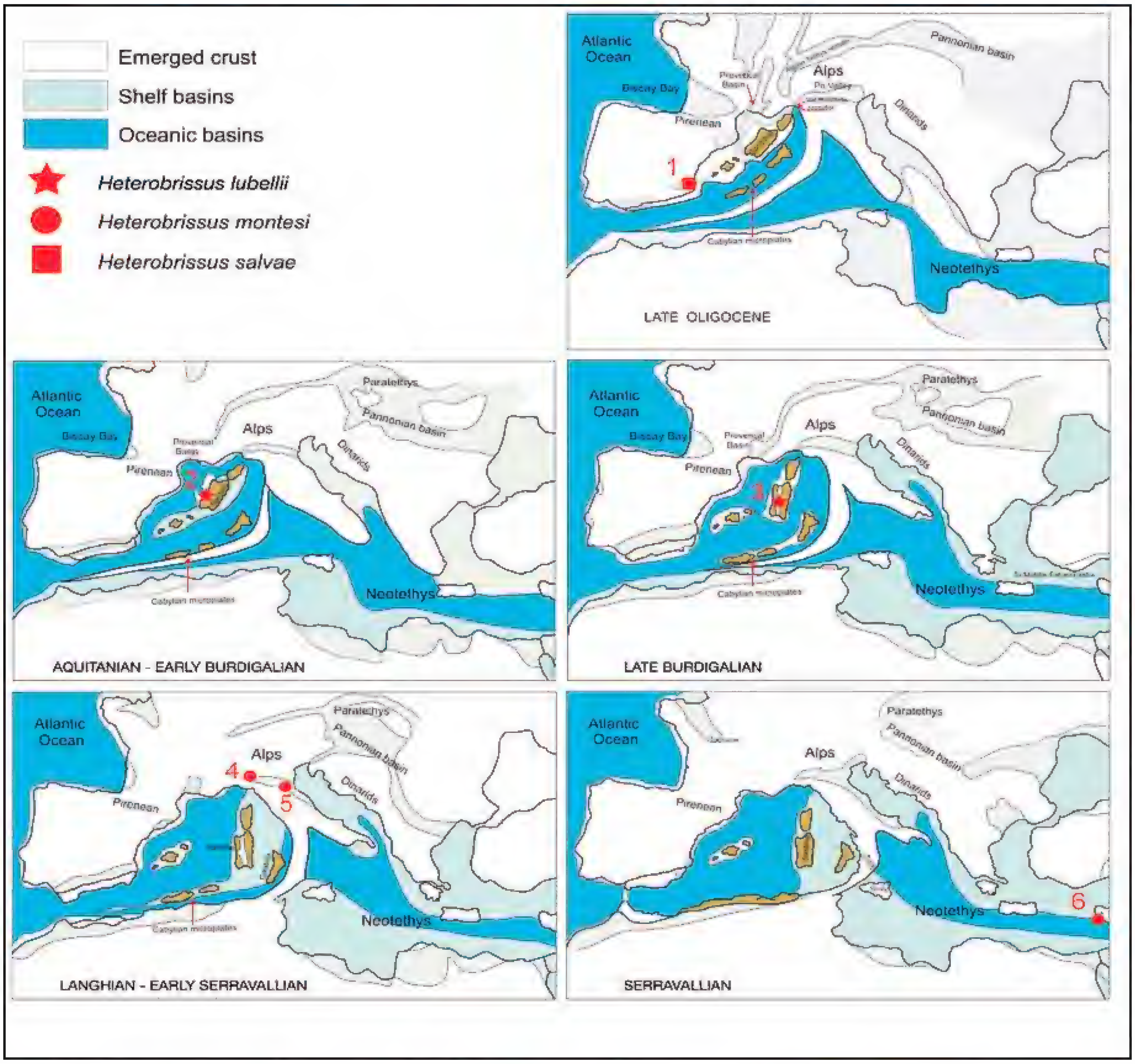

Emerged crust
Shelf basins
Oceanic basins
Heterobrissus lubellii
Heterobrissus montesi
Heterobrissus salvae
Atlantic Ocean
Biscay Bay
Provençal Basin
Alps
Po Valley
Pirenean
Pannonian basin
Paratethys
Dinarids
Cabylian microplates
Neotethys
1
2
3
4
5
6
LATE OLIGOCENE
AQUITANIAN - EARLY BURDIGALIAN
LATE BURDIGALIAN
LANGHIAN - EARLY SERRAVALLIAN
SERRAVALLIAN

Figure 1. Location map of the *Heterobrissus*-bearing localities (partially modified from Rosenbaum et al., 2002 and Stara & Rizzo, 2013). 1: Alicante (Spain), Oligocene; 2: Funtanazza (Sardinia), Late Oligocene-Early Aquitanian; 3: Isili and Nureci (Sardinia), Burdigalian; 4: Pino Torinese (Piedmont), Langhian; 5: Guiglia, Montese, Monte Valestra, Pescale, Rocca Malatina, Jano and Zocca (Emilia-Romagna), Langhian; 6: Alessa near Limossol (Cyprus), Serravallian.

Six Recent specimens of *H. niasicus* from the Southern China Sea and the Philippines (MAC IVM203, 291-293, 446-448) and one of *Archaeopneustes hystrix* from Florida (Museum of Comparative Zoology, Harvard University, MCZ ECH-7813) were utilised in the discussion.

Systematic palaeontology follows Smith & Kroh (2011) and Kroh & Mooi (2019).

ABBREVIATIONS (used in Fig. 2, Tables 1–3). Fm = Formation (formalised); L1 = periproct height; L2 = periproct width; L3 = distance between the lower margin of the periproct and the test base; L4 = anterior paired petal length (measure from the apical system to the last plate bearing pores); L5 = anterior paired petal width (measured at mid-length); L6= posterior paired petal length; L7 = posterior paired petal width; L8 = distance between the frontal genital pores and the posterior test margin; L9 = distance between the tip of the labrum and the anterior test margin; L10 = labrum length; L11 = sternal plates length. TL, TW, TH = respectively, length, width and height of the test.

CONVENTIONS: in the Tables 1–3, TL is reported in mm, the other data are expressed as % of

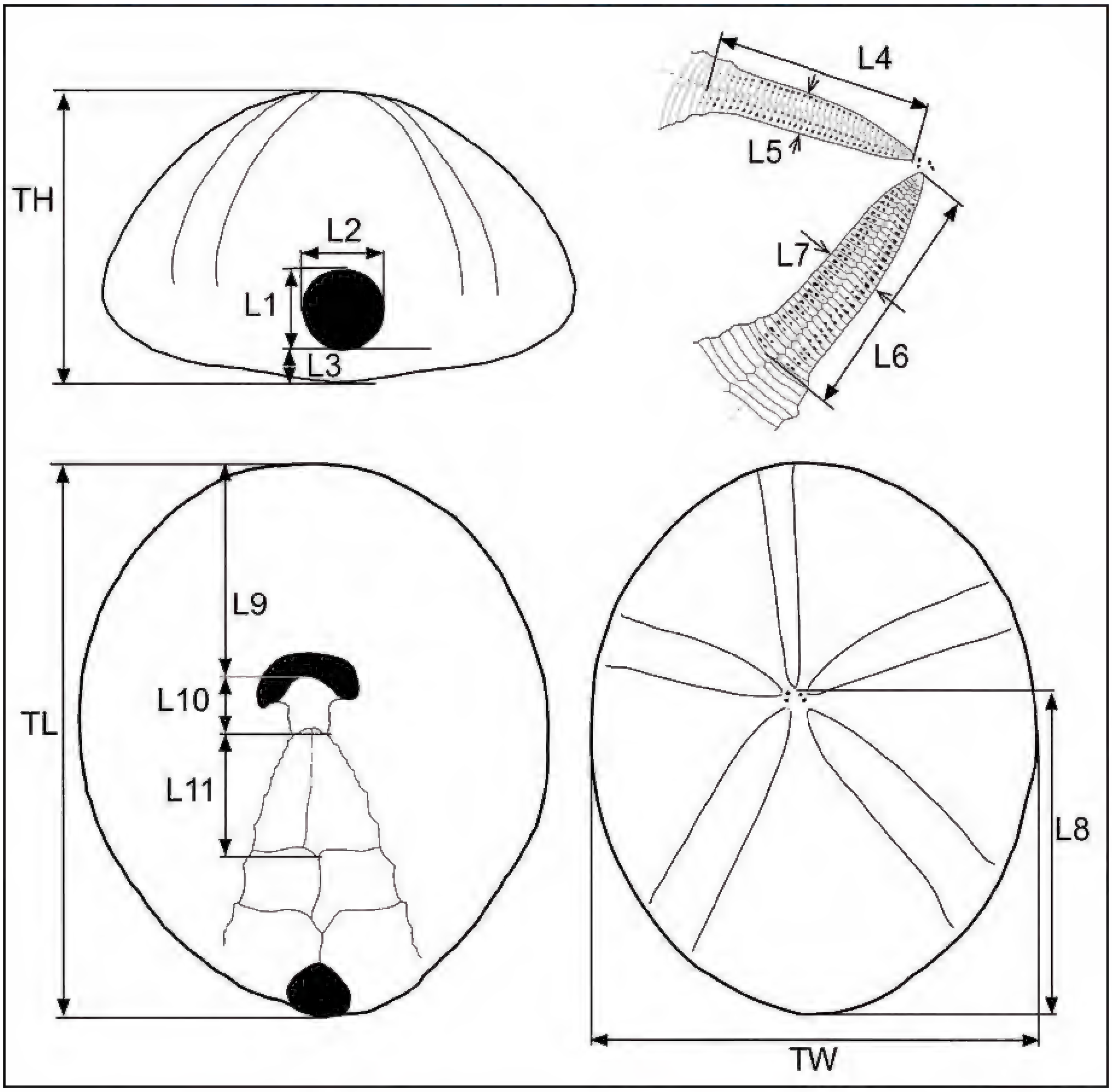


Figure 2. Scheme of the biometric measurements taken from the studied specimens.

Heterobrissus montesi	**TL**	**TW**	**TH**	**L1**	**L2**	**L3**	**L4**	**L5**	**L6**	**L7**	**L8**	**L9**	**L10**	**L11**
IGF 101266	116	80				0						33	10.5	25
IGF 101267	102	86.5		10	8	0						28.5	11	22.5
IGF 100345	104	74				0	42.5	10	47	11	56			
IGF 100346	101	77				0	46	10	50	12				
IGF 101268	90	96.5				0								
IGF.100335	86			11.5	11.5	0								
Stefanini (1908) pl. 14, fig. 4	98	90	40				46	10.5	51	12	55			
Stefanini (1908) pl. 14, fig. 5	102	79.5		9	7.5							36.5		
Stefanini (1908) specimen II	123	83.5	40.5			0					56	31		
Stefanini (1908) specimen III	108	85									56.5			
Stefanini (1908) specimen IV	99	89									54.5			
Mean values	**102.5**	**84**	**40.5**	**10**	**9**	**0**	**45**	**10**	**49.5**	**11.5**	**55.5**	**32.5**	**11**	**24**

***Heterobrissus lubellii* sp. nov.**	**TL**	**TW**	**TH**	**L1**	**L2**	**L3**	**L4**	**L5**	**L6**	**L7**	**L8**	**L9**	**L10**	**L11**
MDLCA 23788	112	77	57	14	12	0	52	13,5	55	17	54	38	11	25
MDLCA 23789	109	84	51				49.5	12	60.5	14	60	38	9.5	22.5
MDLCA 23790	105	92	45			0	55	13	63	14	55	37		
MDLCA 23791	117	90	49	19	12	0		13	56	15	53	36	10	22
MAC PL1504	94	76.5	48	9	7.5	0	53	14	60	16	66	37		
MAC PL1505	103	92	49.5	15.5	14.5	0	45.5	13	66	14.5	53	37	11	
MAC PL1506	108	83	50	16	12.5	0	51	12	54	15	45	35	11	
MAC PL1508	115	80	38	11	11	0	48	12	56	16	53	35	8	25
MAC PL1860	121	77	48	11	9	0	49.5	11	54.5	12	56			
MAC PL1861	115	83	45	12	10	0	49	13	56.5	15	61			25
MAC PL1862	104	90	55			0	55	13	56	13	53	34	9	
MAC PL1864	103	69	47				45	13.5	51	13.5	57	37	11	23
MAC PL1872	110.5	91	47				54	12	61.5	14	61			
MAC PL1873	127	83	32					10		14	53			
MAC PL2095	125	82	36			0	43	11	56	13	65	38.5	11.5	20
MAC PL2096	110		55			0	47	13	55					
MAC PL2097	96	88.5	49	13.5	12.5	0					63	38	10	21
MAC PL2163	91	88	34			0	41	10	52	12	58	37	9	
Mean values	**109**	**84**	**46**	**13.5**	**11**	**0**	**49**	**12.5**	**57**	**14**	**57**	**37**	**10**	**23**

Hetrobrissus salvae	**TL**	**TW**	**TH**	**L1**	**L2**	**L3**	**L4**	**L5**	**L6**	**L7**	**L8**	**L9**	**L10**	**L11**
Holotype MNHN.F.R62327	84	84.5	56	16.5	15.5	5								
LH.01	80	85.5	46			0	45.5	10	46.5	11	62	32.5	10	
LH.04	72	87.5	51				48		51					
CP.01	75	85					46	9	49	10.5				
CP.02	80	80	54	16.5	14.5	2	47.5	9.5	50	10		34		
CP.03	55	85					48.5	9.5	52	11		34	10.5	26
JS.01	75	82	46.5	13.5	16	1	44	10.5	46	11.5	61	32	11.5	27
CG.01	62	86.5		17.5	16	3		10		11	66	31	9	30
MA.01	69	80										34	11.5	26
Mean values	**72.5**	**84**	**50.5**	**16**	**15.5**	**2**	**46.5**	**10**	**49**	**11**	**63**	**33**	**10.5**	**27.5**

Table 1. Species of the genus *Heterobrissus* Manzoni et Mazzetti, 1878.
Measures of TL in mm, the other biometric data expressed as % of TL.

species	TL	TW	TH	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11
Heterobrissus montesi	102.5	84	40.5	10	9	0	45	10	49.5	11.5	55.5	32.5	11	24
Heterobrissus lubellii sp. nov.	109	84	46	13.5	11	0	49	12.5	57	14	57	37	10	23
Heterobrissus salvae	72.5	84	50.5	16	15.5	2	46.5	10	49	11	63	33	10.5	27.5
Heterobrissus hystrix	127	82	50.5	12.5	13.5	6	-	8	-	9.5	54.5	35	10.5	23

2

Echinopneustes niasicus	TL	TW	TH	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11
MAC IVM291	121	77.5	53	14	12.5	11	45	10	48.5	7.5	61	43	9.5	22
MAC IVM292	124	80	46	14	12.5	9	43	7.5	46	9	57	44	9.5	23.5
MAC IVM293	105.5	79.5	51	14	12.5	6	50.5	11.5	57	12	51.5	44	10.5	
MAC IVM446	137	80	51	15	11.5	8	46.5	9	46	9.5	53	40	10	21
MAC IVM447	114	80	55	14	14.5	6.5	51.5	11.5	56	11.5	55	42	9	20
MAC IVM448	93	77.5	56	13	13	12	47.5	10	48.5	12	55	43	10.5	21.5
Mean values	**116**	**79**	**52**	**14**	**13**	**9**	**47.5**	**10**	**50.5**	**10.5**	**55.5**	**42.5**	**10**	**21.5**

3

Table 2. Species of the genus *Heterobrissus* Manzoni et Mazzetti, 1878. Mean biometric values in the studied samples. Measures of TL in mm, the other biometric data expressed as % of TL. Table 3. *Echinopneustes niasicus* (Doderlein, 1901), Recent. Indo-Pacific. Measures of TL in mm, the other biometric data expressed as % of TL.

TL. In the plating schemes, the plates are numbered according to Lovén's system (Lovén, 1874), the interambulacral zones are shaded grey, ambulacra unshaded.

Finding localities

The Bismantova Group (Northern Apennines) consists of the Pantano Fm and the Cigarello Fm (Amorosi et al., 1993). The Pantano Fm deposited during the Late Burdigalian-Langhian (Bettelli et al, 1989; Panini et al., 2005). The upper limit with the overlying Cigarello Fm is dated to the Langhian, within the *Praeorbulina glomerosa* zone and the lower part of the *Orbulina suturalis-Globorotalia peripheroronda* zone (Amorosi et al., 1996). Most of the specimens of *Heterobrissus* described in Manzoni (1880) and Stefanini (1908) were collected from siltstones overlying the Calvenzano Member at Jano and San Leo, near Sasso Marconi (Bologna). They belong to the upper part of the Pantano Fm that in that area has been dated to the Langhian and represents the deposition in an outer shelf setting (Panini et al., 2005). Also at Monte Valestra (Reggio Emilia province) the most frequent lithology consists of grey sandy siltstones, alternating with stratified arenites. The echinoids, commonly deprived of spines and randomly oriented, are rather frequent within the graded arenite, representing low-energy resedimentation events from shallower settings. *Heterobrissus* is commonly associated with *Mazettia pareti* (Manzoni, 1879) and *Toxopatagus italicus* (Manzoni & Mazzetti, 1878) (see Borghi, 2012, 2013 and Stara & Borghi, 2012, for an overview).

The main *Heterobrissus*-bearing deposits examined in Sardinia belong to the Nurallao formation, which is represented at the base by the Duiddure member, made of coarse clasts from transitional (deltaic) environments, and of the overlying marine deposits of the Arenarie di Serralonga member, dated to the Aquitanian-Early Burdigalian (Sowerbutts & Underhill, 1998). At Isili (Cagliari province), four specimens attributed to *H. montesi* were recorded from the upper part (Early Burdigalian) of the Arenarie di Serralonga (Stara et al., 2012); 26 additional specimens have been recently collected from this locality by one of the authors

(P.S.). At Isili, *Heterobrissus* was collected from two different outcrops, located near Baraci and Nuraghe Longu; the second outcrop is stratigraphically lower. At Baraci, *Heterobrissus* is associated with *Sardospatangus*, *Opissaster* sp., *Ova ?karreri* (Laube, 1869); *Ova* sp., *Amusium* sp., *Faorina maullui* Stara et Borghi, 2012; at Nuraghe Longu, with *Sardospatangus*, *Opissaster* sp., *Ova ?karreri*; *Ova* sp., *Mariania comaschicariae* Stara, Borghi et Kroh, 2016; *Faorina orbignyi* (Cotteau, 1877), *Schizobrissus* sp. and *Clypeaster* sp. *Heterobrissus* is present in Sardinia also at Funtanazza, in a Late Oligocene to Late Aquitanian deposit (Annino et al., 2000), belonging to the unit E described in Assorgia et al. (1992), precisely in the Calada Bianca sub area (Late Oligocene to Early Aquitanian) described in Mancosu & Nebelsick (2016), and at Nureci and Genoni, in the Burdigalian-Early Langhian Marne di Gesturi formation (Assorgia et al., 1995).

The holotype of *Pygospatangus salvae* Cotteau (1890) was originally reported from the Eocene of Callosa (Alicante Province, Spain). However, this attribution is doubtful since all subsequent citations of this species were Oligocene in age (López & Sillero, 2006; Smith & Kroh, 2011). Also the specimens under study from Monteagudo, near Novelda (Alicante, Spain), were collected from sediments dated by micropaleontological analyses (Azema et al., 1969) to the Late Oligocene (Chattian), possibly also to the Early Aquitanian. The sediments, consisting of limestones alternating with marls, belong to the transgressive phase occurred at the Oligocene-Miocene boundary (Mapa Geologico de Espana, 1:50000, sheets 848 and 871).

RESULTS

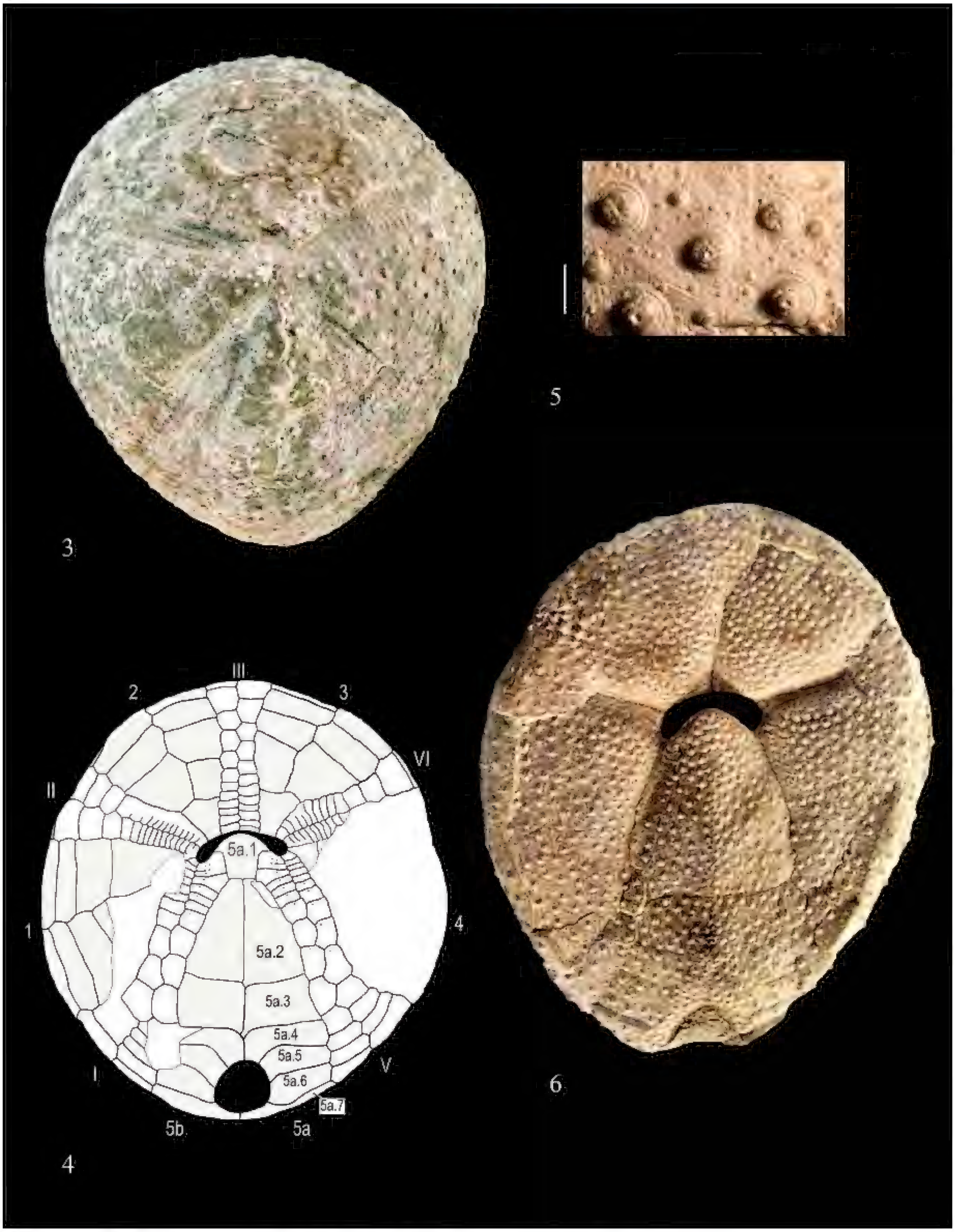
The study of the fossil material of *H. montesi* from the type-area enables to describe previously unknown morphological features in the type-species, thus completing the list of the diagnostic characters in the type-species of the genus *Heterobrissus*. The specimens examined from the Early Miocene of Sardinia share the distinctive features listed in the following and, since they are better preserved on average, some illustrations are taken from them.

- Test ovate in outline with convex anterior and weakly pointed posterior (Fig. 3).
- Shell rather thin aborally; the plastron and the ambitus are more robust, with a maximum thickness of about 2–3 mm in correspondence of the sternal plates and around the periproct.
- Posterior face short and undercut, sometimes almost facing downwards (Figs. 9, 14).
- The apical system is ethmolytic, with four gonopores, the anterior pores placed closer to one another than the posterior pair. It corresponds to the scheme provided by Mortensen (1950, fig. 147) for *Archaeopneustes hystrix*.
- Frontal ambulacrum flush over the aboral surface, becoming slightly depressed only as it approaches the peristome; the pores are double in the upper part of the ambulacrum, farther down they are reduced to a narrow slit (Fig. 12).
- No occluded plates are present at the end of the paired petals (Fig. 10).
- Pores in the outer columns drop-shaped and larger than those in the inner columns (Fig. 11).
- Adorally, the ambulacra are strongly developed into conspicuous phyllodes (Figs. 8, 13): there are 7-8 unipores with a large periporal area in each column of the ambulacrum III, 10–12 in the lateral ambulacra II and IV (Fig. 13).
- The labral plate extends to half-way along the third plate in the adjacent ambulacral columns (Figs. 13, 19).
- Sternal, episternal and post episternal plates almost symmetrical, opposite rather than alternate and not indented by the ambulacral plates. The sternals extend to the adjoining ambulacral plates 9–10. Plates 5.a.4 and 5.b.4 are "L" shaped (Figs. 4, 13, 19).
- The structure of the plates in the oral interambulacra 1, 2, 3, 4 is amphiplacous. (Figs. 4, 13).
- Periproct inframarginal to almost oral (Figs. 4, 9, 14), framed by the plates 5.a.4, 5.b.4 to 5.a.7, 5.b.7 (Figs. 4, 13, 19).
- Primary spines finely striate longitudinally, with a hollow lumen and circular section.
- Fascioles absent (at least in all the specimens with TL > 38 mm).

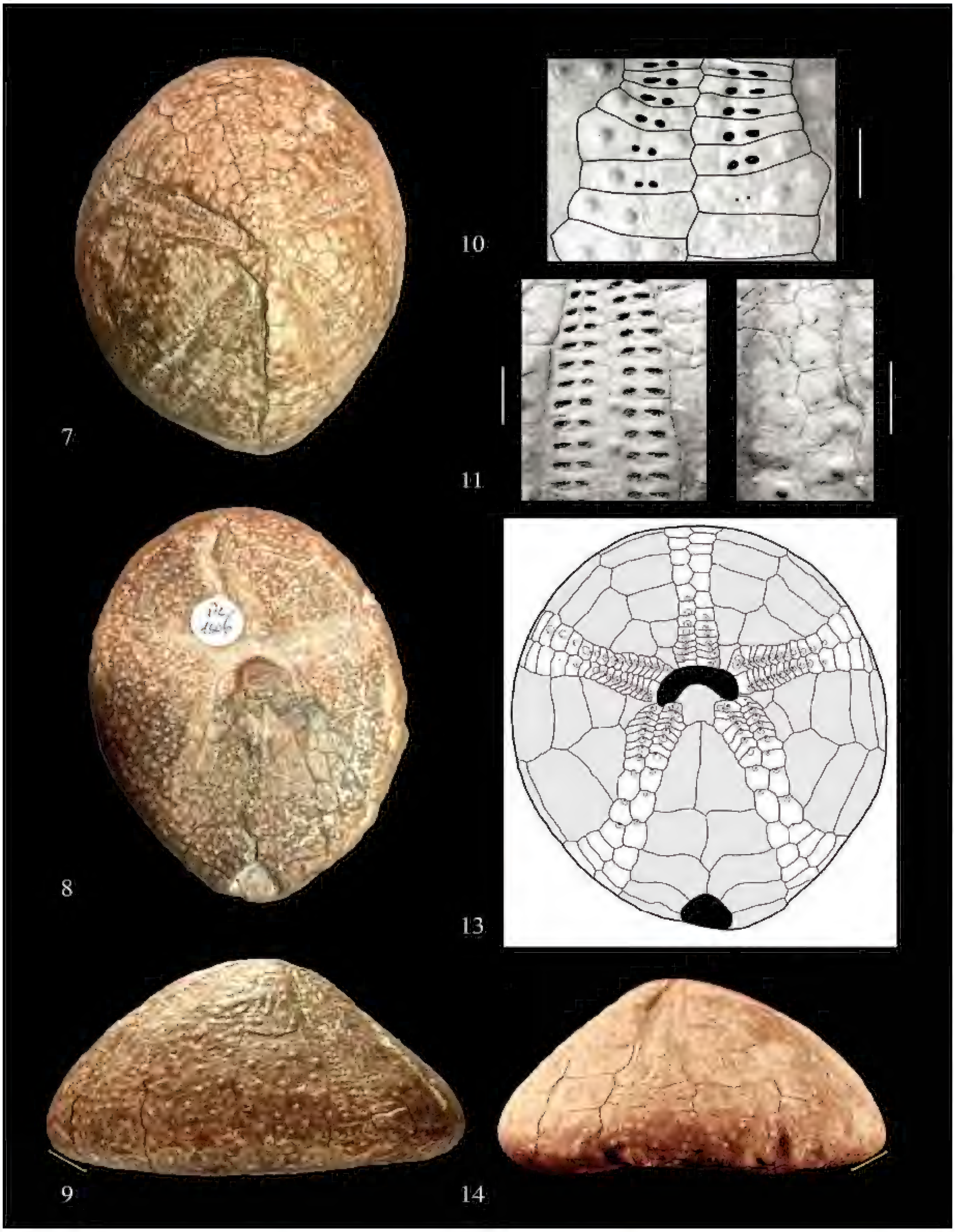
DISCUSSION

The sample from Sardinia

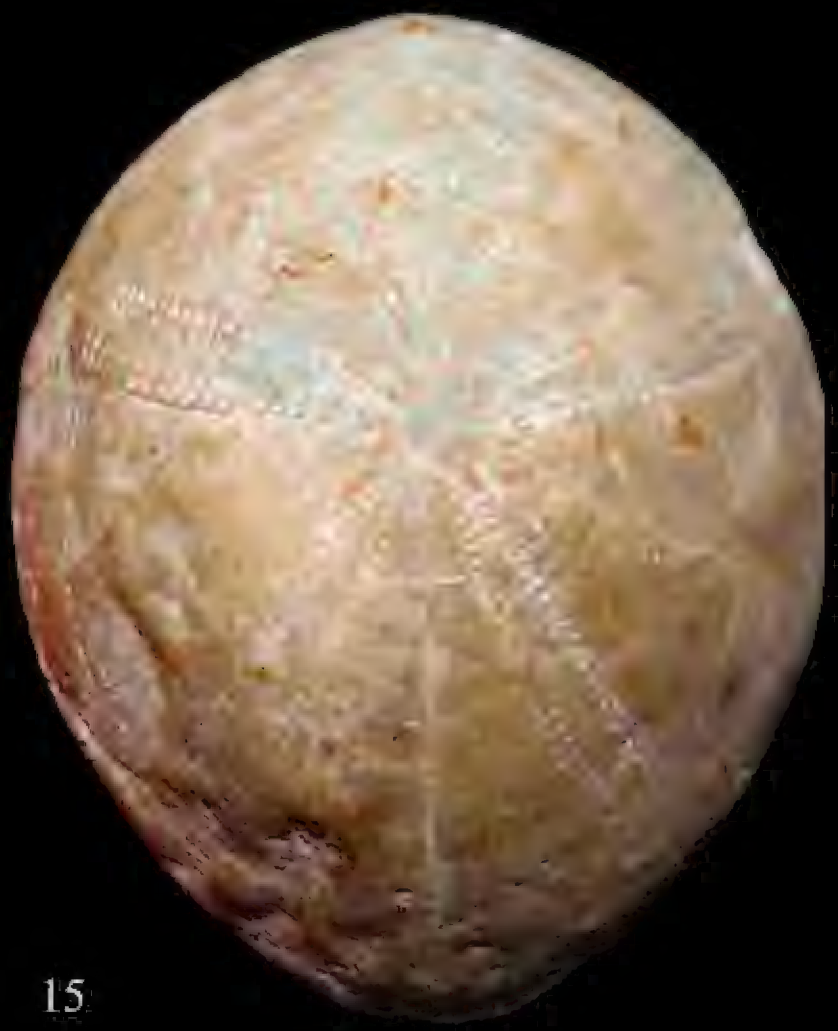
As seen above, the specimens examined from the Early Miocene of Sardinia share all the main



Figures 3–6. *Heterobrissus montesi* Manzoni et Mazzetti, 1878, Langhian of Emilia-Romagna. Fig. 3: aboral view of IGF.104267, a specimen figured in Stefanini (1908, pl. 14, figs. 4a,b), TL = 98 mm, Jano (Bologna). Fig. 4: oral plating diagram taken from IGF.100335, Jano. Fig. 5: close up of the primary tubercles at the ambitus in the aboral interambulacrum 4, taken from IGF.101267, Monte Valestra (Reggio Emilia). Fig. 6: oral view of IGF.101266, TL = 116 mm, Monte Valestra. The scale bar equals 1 mm.



Figures 7–14. *Heterobrissus lubellii* n. sp., Early Miocene of Sardinia. Figs. 7–9: respectively aboral, oral and lateral views of the holotype (MDLCA.23788), TL = 112 mm, Burdigalian, Isili. Figs 10–12: MAC.PL1505, Burdigalian, Isili: close up view of the tip of a petal (Fig. 10), of the mid part of the aboral ambulacrum IV (Fig. 11) and of the frontal ambulacrum III (Fig. 12); the scale bars equal 5 mm. Fig. 13: oral plating diagram of MAC.PL2097, Early Burdigalian, Baraci. Fig. 14: lateral view of MAC.PL1504, TL = 94 mm, Burdigalian of Isili; the yellow bars indicate the position of the periproct in lateral view.



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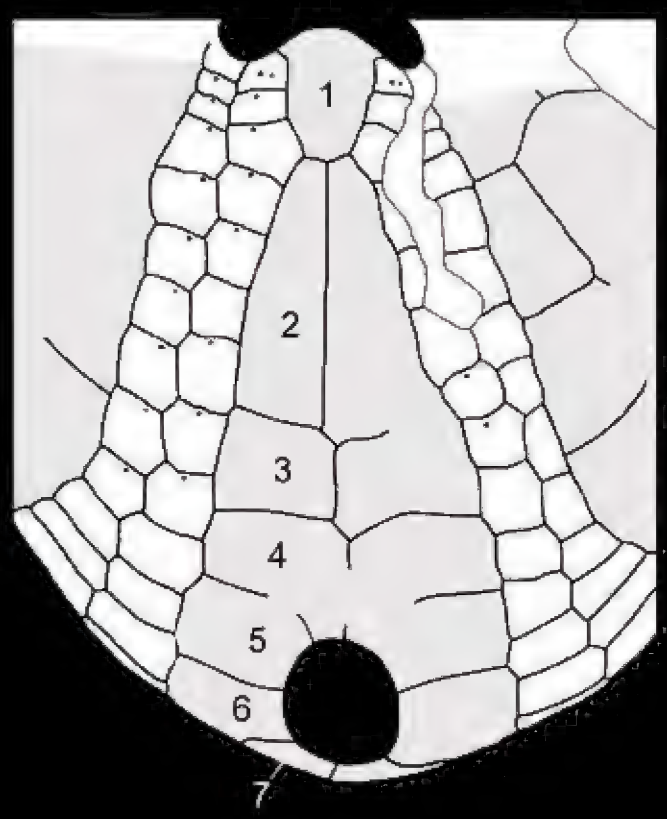

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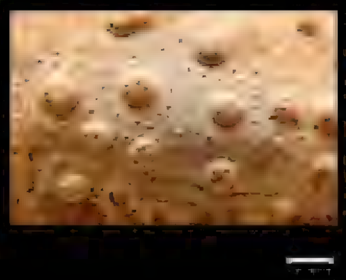

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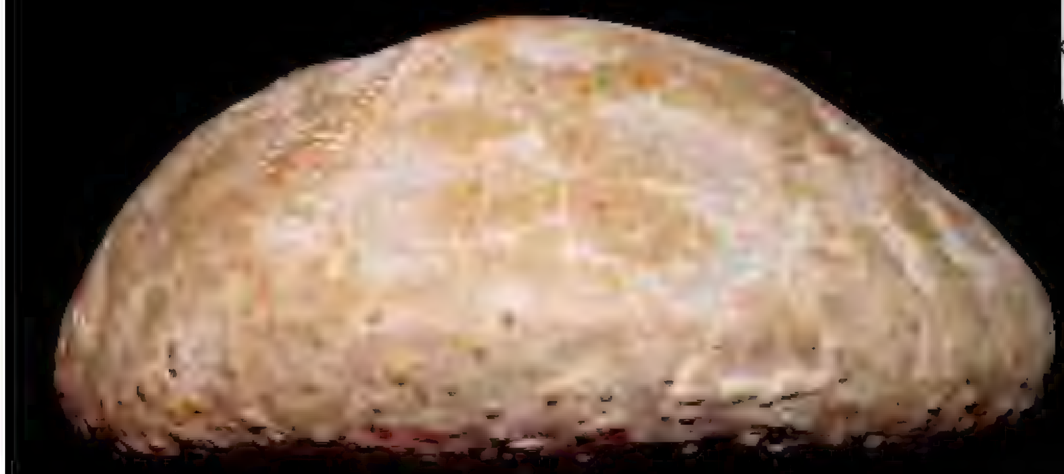

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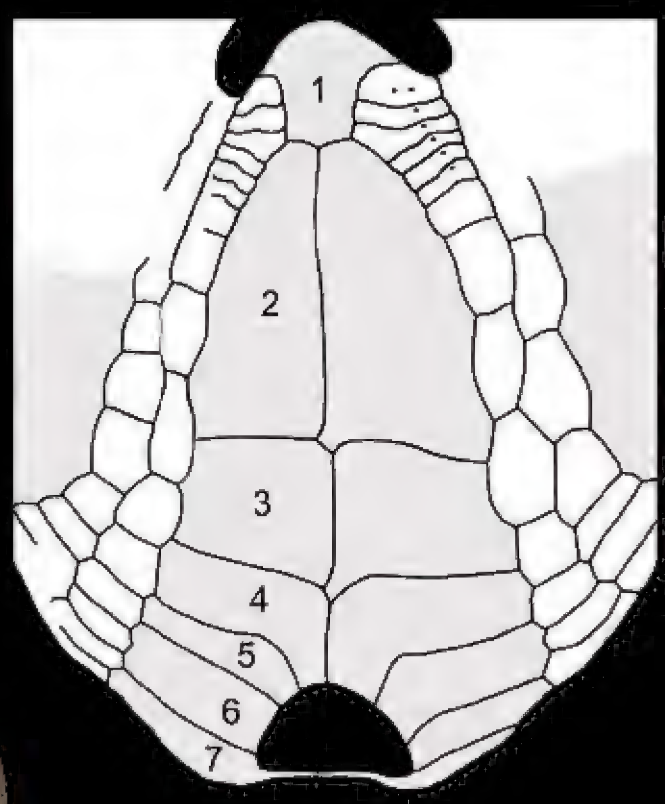

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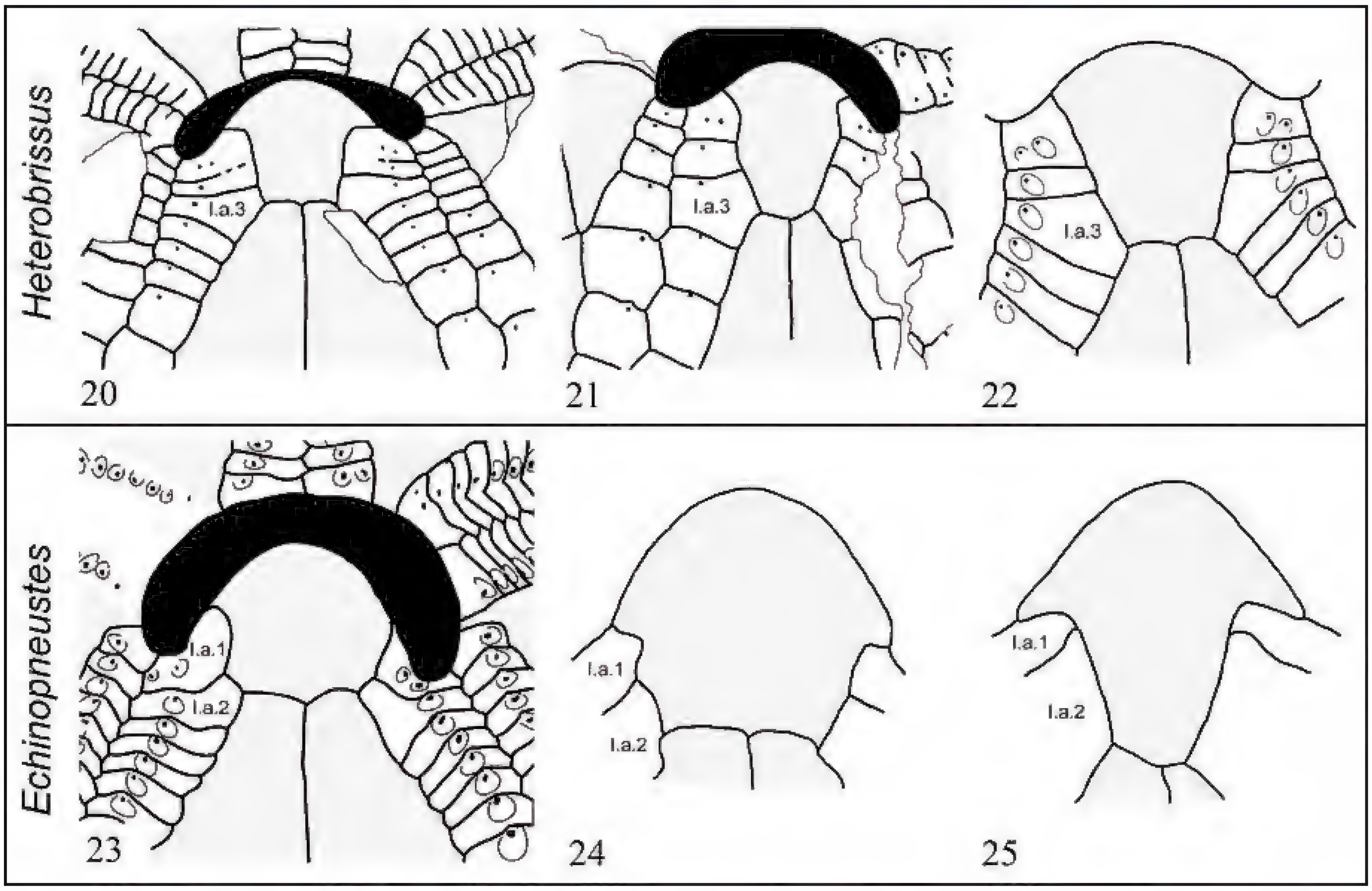
Figures 15–18. *Heterobrissus salvae* (Cotteau, 1890), Late Oligocene of Monteagudo, near Novelda (Spain). Figs. 15–16: aboral and lateral views of LH.02, TL = 95 mm. Fig. 17: plastron plating in JS.01. Fig. 18: close up of primary tubercles in the aboral interambulacrum 4 at the ambitus, in CG.01. The scale bar equals 1 mm. Figure 19. *Heterobrissus montesi* Manzoni et Mazzetti, 1878: plastron plating taken from IGF.101266, TL = 116 mm, Langhian of Monte Valestra, near Reggio Emilia.



Figures 20–25. Plating schemes of the peristome area highlighting the extension of the labrum. Fig. 20: *Heterobrissus montesi* Manzoni et Mazzetti, 1878; Fig. 21: *Heterobrissus salvae* (Cotteau, 1890); Fig. 22: *Heterobrissus hystrix* (Agassiz, 1880), from Mortensen (1950): Fig. 23: *Echinopneustes niasicus* (Doderlein, 1901); Fig. 24: *Echinopneustes gigas* (Baker et Rowe, 1990); Fig. 25: *Echinopneustes erinaceus* (Baker et Rowe, 1990).

morphological features with the fossils from the Northern Apennines. Stara et al. (2012) assigned eight specimens from Baraci to *Heterobrissus montesi*. However, the availability for this study of a better preserved sample from a stratigraphically more differentiated area showed that the specimens from Sardinia differ from *H. montesi* by longer and larger petals, peristome farther from the anterior margin of the test, larger periproct and more elevate test (Table 2). Therefore, they are herein assigned to a new species, *Heterobrissus lubellii* n. sp.

Comparison with other genera

Gregory (1892) based the genus *Archaeopneustes* on the Recent species *Palaeopneustes hystrix* A. Agassiz, 1880 (Figs. 27, 31) without considering its differentiation from the pre-existing genus *Heterobrissus* Manzoni et Mazzetti, 1878.

The distinction of *Archaeopneustes* was confirmed by Mortensen (1950): "*the labrum extending to the third adjoining ambulacral plate, not to the second as in* Heterobrissus", and by a slightly more inframarginal periproct. But the plate structure in *H. montesi* was still unknown at that time, as well as the apical system (Stefanini, 1908). Mortensen (1950) based his concept of *Heterobrissus* on an Indo-Pacific species, *H. niasicus*, which differs from the western Atlantic *A. hystrix* in the ways described. The topo-typic material under study indicates that *H. montesi* has an inframarginal periproct and an elongate labrum that extends to the third ambulacral plate, thus sharing the main diagnostic features of *Archaeopneustes* and confirming the synonymy of the two genera, as already suggested by Smith & Gale (2009) and Kroh & Mooi (2019).

Mortensen (1950, p. 200) affirmed also that "*If the character of the labrum (in* H. montesi*) should prove ultimately to agree with* Archaeopneustes hystrix*, then I do not see how it could be avoided to regard* Archaeopneustes *as a synonym of* Heterobrissus*, but it might then be desirable to create* *a new genus for the species* niasicus...". According to this sentence, *H. niasicus* (Döderlein, 1901) is here transferred into *Echinopneustes* n. gen. The main morphological characters distinguishing *Echinopneustes* from *Heterobrissus* are (Table 4): the labrum reaching only the middle plate 2 of the adjoining ambulacra (Fig. 23), not plate 3 as in *Heterobrissus* (Figs. 20, 22); the peristome farther from the anterior test margin (mean L9> 38% TL); periproct marginal (Figs. 30, 37; mean L3 $\geq$ 9%TL), commonly not visible in oral view (Figs. 28, 35) and bounded by the fifth plates in the interambulacrum 5, whereas the periproct is inframarginal to almost oral (L3 $\leq$ 6%TL) and framed adorally by the fourth plates, in *Heterobrissus*. Additionally, in *Echinopneustes* gen. nov. the test outline is commonly less constricted posteriorly (Figs. 28, 35) and the posterior face is not, or only slightly, undercut (Fig. 36). *Heterobrissus erinaceus* Baker et Rowe, 1990 and *H. gigas* Baker et Rowe, 1990 share these diagnostic characters (Figs. 24–25) with *E. niasicus*, consequently, they are transferred into the new genus. After Kohler (1914) in *H. hemingi* (Anderson, 1902) the labrum extends only "*to the margin of the first adjoining ambulacral plate*"; however, since Kohler did not provide a scheme and no specimens are available to study this rare species, its generic attribution is left open.

Mortensen (1950) noticed that in *E. niasicus* the primary spines are flattened and densely thorny and the ophicephalous pedicellariae are numerous, while in *H. hystrix* the primary spines are smooth and roundish and ophicephalous valves are lacking. However, spines in *Echnopneustes* are heterogeneous, since *E. erinaceus* has numerous fine and short spines and even in *E. niasicus* the spines may have sometimes a roundish section, with fine thorns. The difference regarding the ophicephalous pedicellariae is valid for the extant species belonging to these two genera (including also *E. erinaceus* and *E. gigas*, Table 4), but these minute morphological particulars are not preserved in the fossil material thus preventing comparison.

Pygospatangus Cotteau, 1890 is similar to *Heterobrissus*, but relevant characters of the oral face and the apical disc in the type species have so far remained unknown (Smith & Kroh, 2011). Newly reported material from the Oligocene of Novelda (Spain; Figs. 15–17, 18, 21, 29, 33) allows to illustrate the structure of the plastron (Fig. 17), which was not visible in the holotype (MHNM R62327), the sole specimen described by Cotteau (1890: p. 17, pl. 14, fig. 13). The test outline is ovate with convex anterior and weakly pointed posterior (Figs. 15, 29). The oral face is flat, the

Morphological characters	***Heterobrissus***				***Echinopneustes***		
	montesi	***hystrix***	***salvae***	***lubellii* sp. nov.**	***niasicus***	***erinaceus***	***gigas***
Labral plate extending to the ambulacral plate 2					2	2	2
" " " plate 3	3	3	3	3			
Distance of the peristome from the anterior margin:							
mean L9 > 38% TL					42.5	38.7	38.3
mean L9 < 37% TL	32.5	35	33	37			
Periproct marginal, mean L3 $\geq$ 9%TL					9	x	x
" inframarginal, mean L3 $\leq$ 6%TL	0	6	2	0			
Periproct bounded adorally by plates 5.a.5 and 5.b.5					x		
" " " " 4.a.4 and 4.b.4	x	x	x	x			
Ophicephalous pedicellariae present					x	x	x
" " " absent		x					

Table 4. Main morphological features distinguishing the genus *Heterobrissus* Manzoni et Mazzetti, 1878 from *Echinopneustes* n. gen.

apical disc is ethmolytic and corresponds to the scheme provided by Lopez & Sillero (2006; figs. 241 B–C), the labral plate always extends to the third adjacent ambulacral plate (Fig. 21), the oral interambulacra 1-4 are amphiplacous; the oral plates 5.a.4 and 5.b.4 are "L" shaped (Fig. 17). Aborally, in the lateral ambulacra the pore-pairs terminate 3-4 plates above the ambitus and no occluded plates are present distally. The pore-pairs in the ambulacrum III are small and subcircular adapically, elsewhere the pores are in form of small single oblique slits. The pores of the outer columns in the paired ambulacra are drop-shaped and larger than those of the inner columns. Fascioles are absent (Lopez & Sillero, 2006). The peristome is lunate and rather close to the anterior test margin (Fig. 29; range L9 = 31–34% TL). The periproct is rather large, occupying most of the short and undercut posterior face (Fig. 33). It is marginal, well visible in oral view (Fig. 29) and bounded by four plates on each side (5.a.4 to 5.a.7 and 5.b.4 to 5.b.7; Fig. 17). The oral ambulacra do not indent the posterior interambulacrum. The tuberculation is coarse and heterogeneous and consists of scrobiculate, perforate and crenulate primary and secondary (rare) tubercles and numerous miliares (Fig. 18). Primary spines are slender and longitudinally finely striate; they are 10–15 mm long in a specimen (CG.03) with TL= 60 mm. All these features match with those in *H. montesi*. The test in the holotype of *P. salvae* is very thick (up to 8-9 mm), as illustrated in Smith & Kroh (2011). However, in all the other specimens under study the test is relatively thin aborally and, although the thickness increases adorally particularly in the plastron and around the periproct, it is not very different from that in *Heterobrissus montesi*. *Pygospatangus salvae* differs from *H. montesi* also by the plates in the proximal part of the oral ambulacra I and V, that are longer and, as a consequence, the sternal plates extend only to the ambulacral plates 7–8, not to the plates 9-10 as in *H. montesi* (compare Figs. 17–19). The oral posterior ambulacra lack large primary tubercles from the peristome almost to the margin; however, some specimens of *H. montesi* from the type-area (e.g., IGF.100335) and from Cyprus share the same feature. These differences point to a distinction only at the specific level, consequently this species is here renamed *Heterobrissus salvae* (Cotteau, 1890), new combination.

Antillaster Lambert, 1909 is known from the Eocene to Miocene of the Caribbean and the Eocene of the Caucasic area (McNamara et al., 2002). The type-species, *A. cubensis* Cotteau, 1871, has only 3 gonopores. Kier (1984) revised this genus and separated it into two informal "groups", "pointing to the occurrence of a number of intermediate forms. The oldest group (Eocene-Oligocene) is morphologically more similar to *Heterobrissus* and shares the presence of four gonopores and the shape of the phyllodes. However, the species belonging to this group differ from *H. montesi* by a more depressed test, oral face convex, not flat, narrower petals extending farther towards the test edge and a different position of the periproct. Occluded plates are always present at the end of the paired petals in all the species of *Antillaster* in which the plate sutures are visible (Kier, 1984), whereas they are absent in *H. montesi* and in *H. salvae*.

The genus *Brissolampas* Pomel, 1883 was based on *Palaeopneustes conicus* Dames, 1877, from the Aquitanian of Veneto (Northern Italy). The main characters stated for this species match with those in *Heterobrissus* but the ambulacrum III is described as "petaloid". Since the sole specimen so far known of this species (Dames, 1877: p. 47, pl. 8, fig. 1) has the frontal ambulacrum only partially visible, new topotypic material is needed to confirm the separation of this genus from *Heterobrissus*.

Systematic placement of Heterobrissus *and* Echinopneustes *n. gen.*

On account of the ethmolytic apical disc, the petaloid ambulacra (at least adapically) and the amphisternous plastron, *Heterobrissus* and *Echinopneustes* are members of the order Spatangoida. Earlier studies attributed *Heterobrissus* to various families. Mortensen (1950) suggested that *Heterobrissus*, *Archaeopneustes* and *Pygospatangus* should be placed under the *Palaeopneustidae*. Later on, *Heterobrissus* and *Pygospatangus* were placed into the Asterostomatina by Fischer (1966). However, the grouping together of spatangoid taxa that lack fascioles as adults into Mortensen's Palaeopneustidae or Fischer's Asterostomatina has historically been regarded as unsatisfactory (Fischer, 1966; Chesher, 1968). In particular, the attribution to the Asterostomatidae was strongly rejected by the results of the cladistic analysis in Stockley et al. (2005, fig. 1): the polyphyletic arrangement of the fasciole-less "asterostomatids" highlighted by both molecular and morphological analyses strongly implied that there were multiple origins for these deep-sea spatangoids. Only a few genera originally attributed to the paleopneustids by Mortensen (1950) are today retained in this family (Smith & Kroh 2011). The Paleopneustidae appear to represent a small clade basal to prenasterids and schizasterids (Stockley et al., 2005; Kroh & Smith 2010); they are characterized by the lack of a frontal groove, long labral plate extending to the third or fourth ambulacral plate and marginal and/or peripetalous fascioles, at least in juveniles. After Smith & Kroh (2011) these characters fit well with *Heterobrissus* and *Pygospatangus*, which were included in the "*Paleopneustina* Incertae sedis B". Kroh & Mooi (2019) actually confirm this location, accepting it as a "*temporary name*".

One of the major problems in firmly reconstructing relationships between spatangoida lacking fascioles, just as *Heterobrissus* and *Echinopneustes*, is the common occurrence of secondary loss of fascioles in adults. Many deep-sea groups appear to have undergone secondary morphological simplification involving the loss of fascioles and/or reduction or complete loss of petals. In fact, fascioles are essential structures for an infaunal mode of life, but they serve no purpose in epibenthic species and are therefore commonly lost in deep sea forms. The absence of petals and fascioles is commonly interpreted as plesiomorphic, but when additional data are available, including the fasciole bearing in juveniles, such absence is recognized as being secondary reversals and a different topology results in cladistic analyses (Stockley et al., 2005). Recent analyses, such as Kroh & Smith (2010) and Kroh in Stara et al. (2016), based on the matrix proposed by Stockley et al. (2005, p. 21-22), under exclusion of the fasciole characters, resulted in a largely unresolved tree and failed to conclusively resolve the systematic placement of *Heterobrissus* (represented in the analysis by *H. hystrix*). To fully resolve the placement of *Heterobrissus*, *Echinopneustes* and several other atelostomates, additional data on ontogenetic development of fascioles is needed. Unfortunately, no information about the presence of fascioles in juveniles is so far available for the genera under study.

SYSTEMATIC PALEONTOLOGY

Superordo ATELOSTOMATA von Zittel, 1879
Ordo SPATANGOIDA L. Agassiz, 1840
Subordo PALEOPNEUSTINA Markov et Solovjev, 2001
Familia PALEOPNEUSTINA incertae sedis B (Smith et Kroh, 2011)

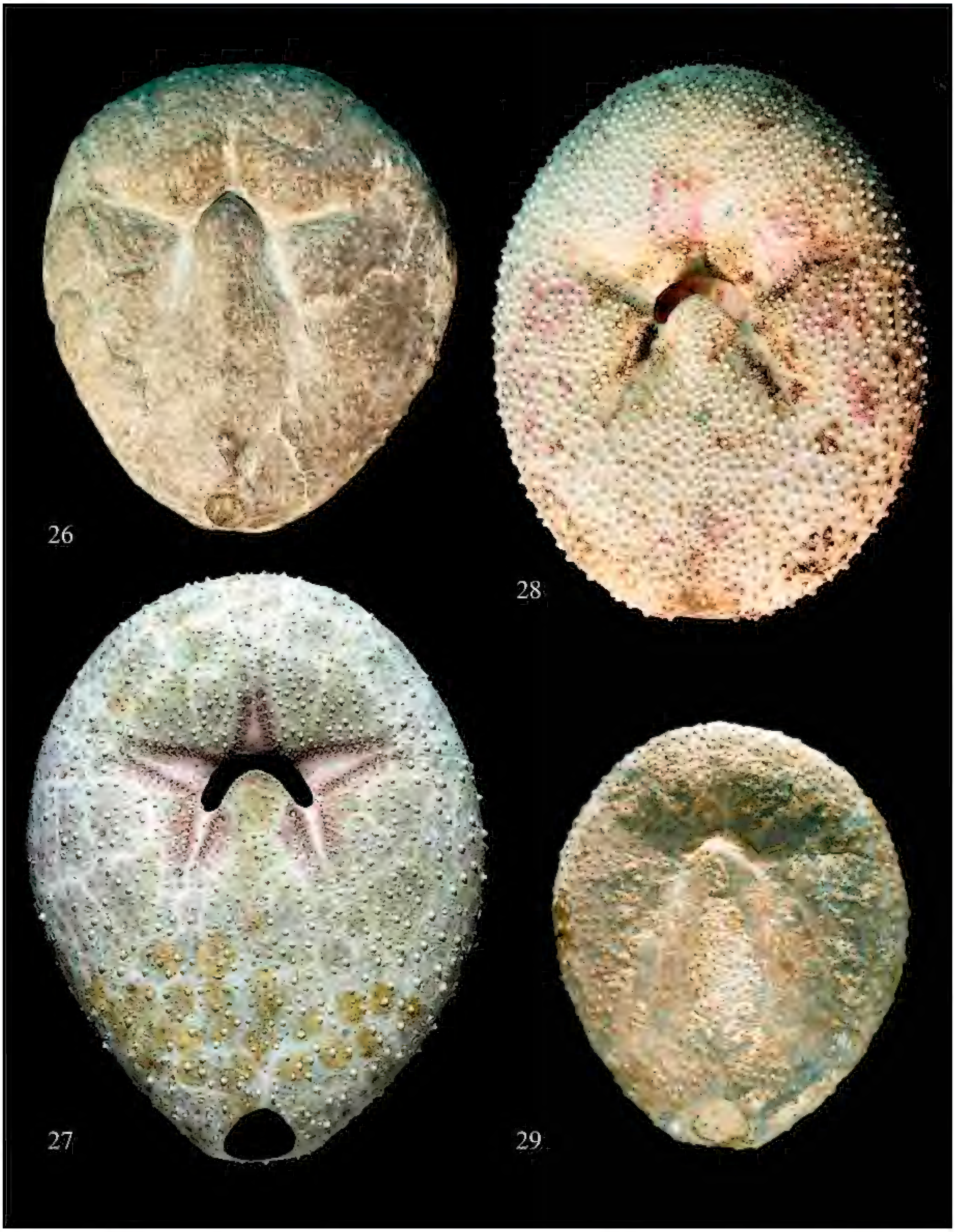
Genus ***Heterobrissus*** Manzoni et Mazzetti, 1878

Heterobrissus Manzoni & Mazzetti, 1878, p. 354, by original designation. [= *Pygospatangus* Cotteau, 1890, p. 17, type species *Pygospatangus salvae* Cotteau, 1890, p. 17; =*Archaeopneustes* Gregory, 1892, p. 163, type species *Paleopneustes hystrix* Agassiz, 1880].

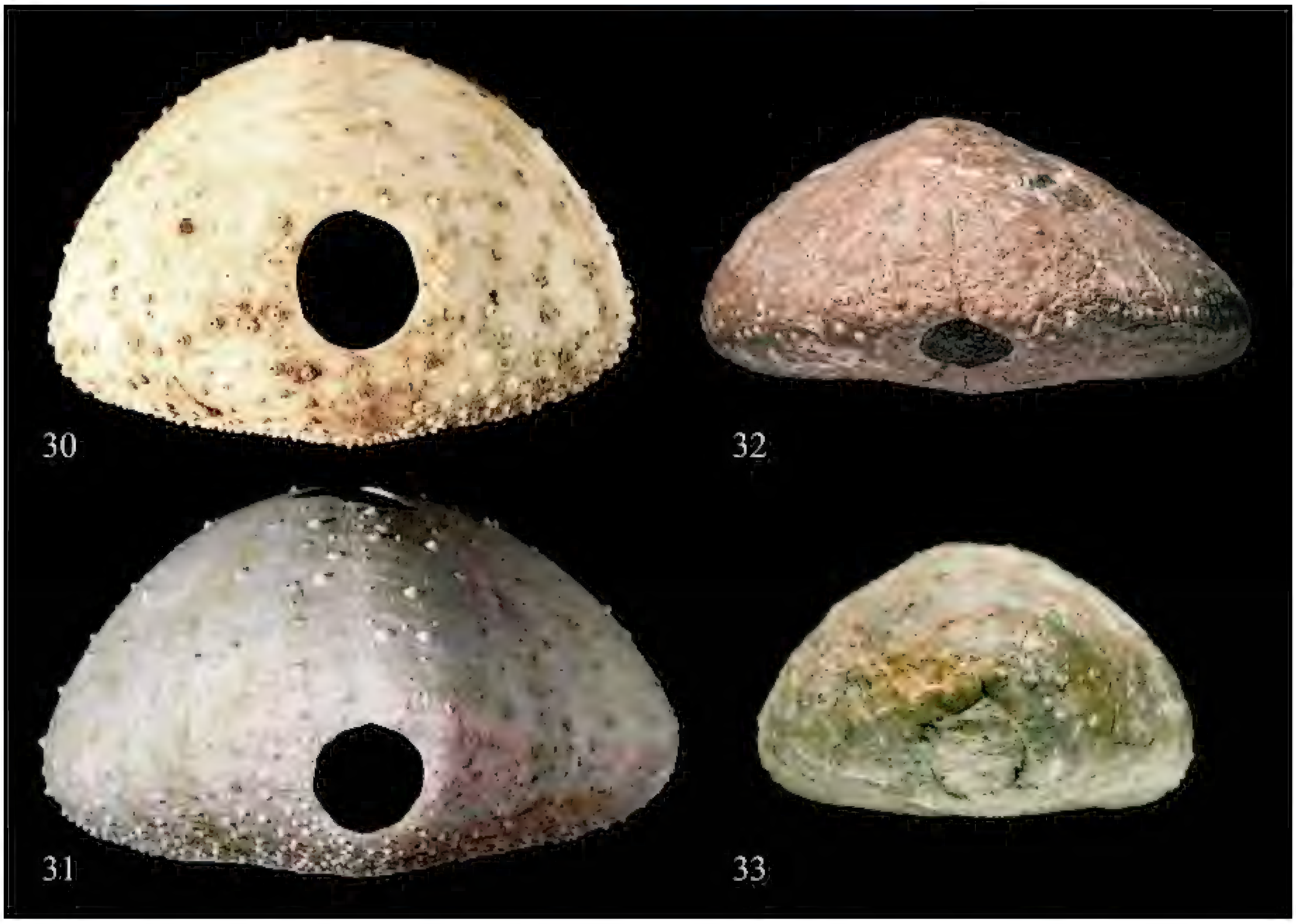
TYPE SPECIES. *Heterobrissus montesi* Manzoni & Mazzetti, 1878, p. 354.

DIAGNOSIS. Test ovate without anterior sulcus; anterior convex, posterior face short, truncate and undercut. Test domed in profile, with flat base. Apical disc ethmolytic, with four gonopores, a little anterior of centre. Anterior ambulacrum narrow, flush; pore-pairs minute adapically, elsewhere in form of small single oblique slits. Paired ambulacra flush, petaloid adapically, almost parallel-sided and largely open distally; enlarged pore-pairs extending almost to ambitus. No occluded plates at the end of the petals. Peristome lunate, facing forward into frontal groove, with rather projecting labrum. The labral plate extends to the adjacent ambulacral plates 3. Perioral area sunken. Phyllodes well developed. Sternal, episternal and post episternal plates almost symmetrical, opposite rather than alternate and not indented by the adjacent ambulacral plates. Periproct inframarginal to almost oral, well visible in oral view; adorally it is bounded by the plates 5.a.4 and 5.b.4. Fascioles absent, at least in all the examined specimens with TL > 38 mm. Aboral tuberculation coarse and heterogeneous, made of scrobiculate, perforate and crenulate primary and (rare) secondary tubercles and numerous granules. Posterior ambulacra on oral surface covered in tubercles behind phyllodes. Partially modified from Smith & Kroh (2011).

SPECIES INCLUDED. • *H. montesi* Manzoni & Mazzetti, 1878; Langhian, Italy; Serravallian, Cyprus.



Figures 26–29. Oral face views. Fig. 26: *Heterobrissus montesi* Manzoni et Mazzetti, 1878 (IGF.101267, TL = 102 mm), Langhian, Monte Valestra, near Reggio Emilia. Fig. 27: *Heterobrissus hystrix* (Agassiz, 1880), MCZ ECH-7813, TL = 127 mm, Recent, off Florida. Fig. 28: *Echinopneustes niasicus* (Doderlein, 1901), MAC.IVM210, TL = 124 mm, Recent, Southern China Sea. Fig. 29: *Heterobrissus salvae* (Cotteau, 1890), CG.01, TL = 62 mm, Late Oligocene of Monteagudo, near Novelda (Spain).



Figures 30–33. Posterior face views. Fig. 30: *Echinopneustes niasicus* (Doderlein, 1901), MAC.IVM292, TL = 124 mm, Recent, Southern China Sea. Fig. 31: *Heterobrissus hystrix* (Agassiz, 1880), MCZ ECH-7813, TL = 127 mm, Recent, Florida. Fig. 32. *Heterobrissus lubellii* n. sp. (MAC.PL1506a, TL= 113 mm), Burdigalian, Isili (Sardinia). Fig. 33: *Heterobrissus salvae* (Cotteau, 1890), CG.01, TL = 84 mm, Oligocene, Monteagudo, near Novelda (Spain).

- *H. hystrix* (Agassiz, 1880): Recent, Caribbean.
- *H. salvae* (Cotteau, 1890); ?Eocene and Late Oligocene (Chattian), Spain.
- *H. lubellii* n. sp., Late Oligocene-Early Aquitanian and Burdigalian, Sardinia (Italy).

Distribution. ?Eocene and Late Oligocene of Spain; Late Aquitanian to Langhian of Italy; Serravallian of Cyprus. Recent, Caribbean.

Heterobrissus montesi Manzoni et Mazzetti, 1878 - Figs. 3–6, 19, 20, 26

1878 - *Heterobrissus Montesi* Manzoni & Mazzetti, 354–355, pl. 19, fig. 2.

1879 - *Heterobrissus Montesi* Manzoni & Mazzetti - Manzoni, 162.

1880 - *Heterobrissus Montesi* Manzoni & Mazzetti - Manzoni, 189, pl. 3, figs. 24–26.

1881 - *Heterobrissus Montesii* Manzoni & Mazzetti - Mazzetti, 10.

1901 - *Heterobrissus Formai* Airaghi, 210, pl. 26, fig. 6 (fide Stefanini, 1908).

1908 - *Heterobrissus Montesii* Manzoni & Mazzetti - Stefanini, 95–97, pl. 14, figs. 4-5, pl. 15, fig. 1.

1935 - *Heterobrissus cypriotes* Currie, 32, pl. 3, fig. 1.

2009 - *Heterobrissus montesii* Manzoni & Mazzetti - Smith & Gale, 123–124, figs. 6-8.

2012 - *Heterobrissus montesii* Manzoni & Mazzetti - Stara et al., 36, pl. 3, fig. 1a–c.

Type material. The holotype, from Montese (Modena), is missing; it was poorly preserved and the oral face was not visible (Manzoni & Mazzetti, 1878, pl. 19, fig. 2). After Stefanini (1908), the holotype and the other specimens figured in Manzoni (1880: pl. 3, figs. 24–26) were already missing at that time.

TYPE LOCALITY. Montese (Province of Modena), Langhian, Pantano Formation.

OTHER EXAMINED MATERIAL. Twelve specimens from Jano, near Sasso Marconi (Province of Bologna) housed at the IGF, including the two figured in Stefanini (1908, pl. 14, figs. 4 and 5) and those reported in his description as "specimens II, III and IV". Five specimens from Monte Valestra, Province of Reggio Emilia (IGF.101266-7, IGF.100345-6), and one from Pescale, Province of Modena (IGF.101268). All of them from the Langhian, Pantano Formation.

DESCRIPTION. Large sized species (TL up to 123 mm). Test longitudinally elongate (mean TW = 84% TL) and more or less constricted posteriorly, with maximum width in front of mid-length (Fig. 3). Test with low domal upper surface and flat oral face, sinking towards the peristome (Fig. 6). Posterior face short and undercut, sometimes almost facing downwards. Test height variable (mean TH = about 40.5% TL). Ambitus low with rounded margin.

Apical disc - Small, slightly anterior to centre (mean L8 = 55.5% TL), ethmolytic; it has four gonopores, the anteriors are placed closer together than the posteriors.

Ambulacra - Ambulacrum III narrow, flush over the aboral surface (Fig. 3), slightly depressed only as it approaches the peristome (Fig. 26). Adapically there are minute pore pairs; then, starting from the sixth-tenth plate, each plate bears a small slit-like unipore oriented almost vertical to the lower suture, as in *H. hystrix* (compare Mortensen, 1950, fig. 146b); these pores become lost towards the ambitus. Paired ambulacra petaloid adapically, almost flush, only slightly depressed in their upper half; they extend, slightly diverging, almost to the ambitus, remaining open distally. Pore-pairs become slightly smaller towards the end, where no occluded plates are present. In the anterior paired petals the anterior columns of pore-pairs are smaller than those in the posterior columns as they approach the apex. Pore-pairs are drop-shaped isopores, with a narrow, flush interporal zone. Anterior paired petals (mean L4 = 45% TL, L5 = 10% TL) slightly flexed to the anterior and diverging from each other at about 130°. Posterior petals longer (mean: L6 = 49.5% TL, L7 = 11.5% TL), more or less straight and diverging at about 65°. Adorally, the paired ambulacra enlarge and plating becomes crowded as they approach the peristome. Phyllodes well developed, with 6-8 pores in a column in the posterior and the anterior ambulacra and 10-12 in the lateral ambulacra. The pores are single in the phyllodes. There are no enlarged subanal pores.

Interambulacra - Slightly inflated adapically (Fig. 3).

Plastron - Plastron not raised. The labrum strongly indents the peristome (Figs. 6, 26). Labral plate wedge-shaped, with convex surface and always extending to halfway along the third plate in the adjacent ambulacra (Fig. 20). Sternum almost as long as wide, with sternal plates symmetrical and extending to plate 9-10 in the adjacent ambulacral columns (Figs. 4, 19). Episternal plates also paired and about half as long as the sternal plates. Plates 5.a.4 and 5.b.4 weakly offset, "L" shaped and forming the oral border of the periproct. Ambulacral plates do not indent the Interambulacrum 5. All other interambulacra amphiplacous. In the interambulacra 1 and 4 the plates a.5 and b.5 or the a.6. and b.6 form the ambitus.

Peristome - Sunken, lunate, much wider than long and eccentric anteriorly (mean L9 = 32.5% TL, range 28.5–36.5% TL).

Periproct - Inframarginal to almost oral and framed by plates 5.a.4, 5.b.4 to 5.a.7, 5.b.7. (Figs. 4, 26); it is rather small and slightly longitudinally elongate (mean L1 = 10% TL, L2 = 9% TL).

Tuberculation - Primary tubercles scrobiculate, perforate and crenulate (Fig. 5), scattered over the entire aboral face; they become denser approaching the apex and along the mid-line of the posterior interambulacrum. All plates have a covering of sparse miliary granules and occasional smaller tubercles. A few small tubercles also occur within the petals and the frontal ambulacrum. The oral face is fully covered by smaller and denser primary tubercles, including the labral plate and the plastron (Fig. 6). Ambulacral zones have almost identical tuberculation to that in the interambulacral zones, with scattered primary tubercles, except in the phyllodes.

Spines - Primary spines are almost straight aborally, slightly curved in the oral side, some 20–25 mm long in adults with TL = 70–90 mm; they are longitudinally finely striate with a subcircular section and a hollow lumen.

Fascioles - Absent also in well preserved adult specimens. According to Mortensen (1950), the absence of an adproctal widening of the plates in the ambulacra I.a and V.b adjoining the episternal plates typically confirms the absence of a subanal fasciole.

REMARKS. The morphological variability includes: test more or less posteriorly constricted and elevated, labrum more or less projecting over the peristome. In the smallest specimens under study (TL 38–50 mm) the test outline is sometimes less elongated (Fig. 4), the margin is more inflated, the tuberculation may be less dense and the labrum less projecting over the peristome (Stefanini, 1908).

Heterobrissus salvae (Cotteau, 1890) differs by the plates in the proximal part of the oral ambulacra I and V, that are longer and, as a consequence, the sternal plates extend only to the ambulacral plates 7-8, not to the plates 9–10 as in *H. montesi*. Additionally, the shell is thicker.

Archaeopnuestes abruptus Gregory, 1892, from the Oceanic series of Bissex Hill (Barbados) is represented by a sole specimen of uncertain age (Gregory, 1892). Although not completely preserved, the holotype shows closer affinity to the genus *Antillaster* Lambert, 1909 based on test profile and petal shape. Indeed, it was assigned to *Antillaster* by Lambert & Thiery (1924) and Mortensen (1950). It differs from *H. montesi* also by the anterior paired petals much more diverging (at almost 180°) and extending farther towards the ambitus, by "V" shaped aboral plates and less projecting labrum.

Heterobrissus formai Airaghi, 1901, from Pino Torinese (Piedmont, Italy), was distinguished mainly by the scarcity of the primary tubercles on the aboral surface. Based on the available information (Airaghi, 1901), the holotype and only known specimen of this species was collected from the Baldissero Formation (Langhian). The holotype was lost in 1943 (personal communication, D. Ormezzano, MTPL, June 2007) and no other specimens have been subsequently recorded from that area. Stefanini (1908) had the opportunity of examining the type and affirmed that the lack of primary tubercles was due to abrasion; consequently he considered *H. formai* as a junior synonym of *H. montesi*.

Heterobrissus cypriotes Currie, 1935, from the Pakhna Formation (Serravallian) of Alessa near Limossol (Cyprus), was originally based on badly preserved material. Smith & Gale (2009), with access to better material from the same locality, found no significant differences with the type material from Italy and proposed *H. cypriotes* to be a junior synonym of *H. montesi*. In addition, the oral plating and the structure of the apical disc in the specimens of *H. montesi* under study match with the schemes reported by Smith & Gale (2009; figs. 7a–c).

Archaeopneustes moorefieldi Hall, 1966, from the Early Pliocene Pismo Formation of California, was based on a sole specimen whose preservation prevents confirmation of the presence of the diagnostic characters of *Heterobrissus*. The outer pores of the paired petals are not conspicuously larger than the inner ones, as in *Heterobrissus* (Kier, 1984). Its generic position remains uncertain.

Heterobrissus montesi shows a close similarity with the Recent *Heterobrissus hystrix* (Agassiz, 1880) from the Caribbean. According to Smith & Stockley (2005) and Smith & Gale (2009), in *H. hystrix* the peristome is more anteriorly located and more rounded, and the labral plate projects more strongly. Although the difference in the position of the peristome is not confirmed by our dataset (Table 2), *H. montesi* differs also by its periproct, smaller and almost oral, and by much denser tuberculation aborally; additionally, the primary spines are slender and finely striated longitudinally, not stout and smooth as in *H. hystrix* (Mortensen, 1950).

DISTRIBUTION. Langhian of Emilia-Romagna and Piedmont (Northern Italy).

Heterobrissus lubellii n. sp. - Figs. 7–14, 32 - http://zoobank.org/2830b226-6f5b-4324-9614-da27d4d93c1f

TYPE MATERIAL. The holotype (MDLCA 23788) and seven paratypes (MDLCA 23789, 23790 and 23792; MAC PL1505, PL1506a, PL1508 and PL1861) from the Early Burdigalian of Baraci and Nuraghe Longu, near Isili (Cagliari Province). Other two paratypes (MDLCA 23791 and MAC PL2095) respectively from the Late Burdigalian of Nureci (Oristano Province) and of Genoni (Oristano Province).

TYPE LOCALITY. Baraci and Nuraghe Longu, near Isili (Cagliari Province) 39°44'45.54"N - 9°10'07.78"E.

OTHER EXAMINED MATERIAL. Twenty-five specimens from the Early Miocene of Sardinia: 18 of them from the Early Burdigalian of Isili, 3 from the Late Burdigalian of Nureci, 3 from the Late Burdigalian of Genoni, 1 from the Late Oligocene-Early

Aquitanian of Calada Bianca, near Funtanazza (Oristano Province).

DIAGNOSIS. A species of *Heterobrissus* with the paired petals longer and larger than those in the other species belonging to this genus (L4 = 52%; L5 = 13.5%; L6 = 55%; L7 = 17% TL in the holotype) and with the peristome farther from the anterior margin (L9 = 38% TL in the holotype) (Table 1); the periproct is larger (L1 = 14; L2 = 12% TL in the holotype) than that in the type-species of the genus.

DESCRIPTION. Large sized species (TL up to 127 mm in the studied sample). Test longitudinally elongate (mean TW = 84% TL) and more or less constricted posteriorly, with maximum width in front of mid-length (Fig. 7). Test with low domal upper surface (Figs. 9–14) and flat oral face, sinking towards the peristome (Fig. 8). Posterior face short, undercut and almost facing downwards (Figs. 9–14). Test height variable (mean TH = 46% TL). Ambitus low with rounded margin (Fig. 32).

Apical disc - Small, slightly anterior (mean L8 = 57% TL), ethmolytic, with four gonopores, the anterior pores are placed closer together than the posterior pair.

Ambulacra - Ambulacrum III narrow, flush over the aboral surface, slightly depressed only as it approaches the peristome. In the frontal ambulacrum the pores are double only adapically, farther down they are replaced by a narrow slit-like unipore oriented almost vertical to the lower suture (Fig. 12); these pores disappear towards the ambitus. Paired ambulacra petaloid adapically, almost flush, only slightly depressed in their upper half; they extend, slightly diverging, almost to the ambitus, remaining largely open distally (Fig. 7). Pore-pairs become slightly smaller towards the tip of the petal, where no occluded plates are present (Fig. 10). In the anterior paired petals the anterior columns of pore-pairs are smaller than those in the posterior columns as they approach the apex. Pore-pairs are drop-shaped isopores, with a narrow, flush interporal zone. Anterior paired petals long and wide (mean L4 = 49% TL, L5 = 12.5% TL), diverging from each other at about 130°. Posterior petals more or less longer and wide (mean: L6 = 57% TL, L7 = 14% TL), more or less straight and diverging at about 65°. Adorally, the paired ambulacra enlarge and the plating becomes crowded as they approach the peristome (Fig. 13). Phyllodes well developed, with 6-8 pores in a column in the ambulacra I, III, V, and 10-12 in the lateral anterior ambulacra. The pores are single in the phyllodes.

Interambulacra - Only slightly inflated adapically.

Plastron (Fig. 13) - Plastron not raised. The labrum strongly indents the peristome (Fig. 8). Labral plate wedge-shaped, with convex surface and extending to halfway along the third plate in the adjacent ambulacra. Sternum almost as long as wide with sternal plates symmetrical and extending to plates 9–10 in the adjacent ambulacral columns. Episternal plates also paired and about half as long as the sternal plates. Plates 5.a.4 and 5.b.4 weakly offset, "L" shaped and forming the oral border of the periproct. The ambulacral plates do not indent the Interambulacrum 5. All the other interambulacra are amphiplacous. In interambulacra 1 and 4 the plates a.5 and b.5 or the a.6. and b.6 form the ambitus.

Peristome - Sunken, lunate, much wider than long and with a strongly projecting labrum. It is eccentric anteriorly but rather far from the test edge (mean L9 = 37% TL, range 34–38.5% TL).

Periproct - Inframarginal to almost oral (Fig. 32) and framed by plates 5.a.4, 5.b.4 to 5.a.7, 5.b.7. (Fig. 13); it is subcircular to slightly longitudinally elongate (mean L1 = 13.5% TL, L2 = 11% TL).

Tuberculation - Primary tubercles scrobiculate, perforate and crenulate, scattered over the entire aboral surface. All plates have a covering of sparse miliary granules and occasional smaller tubercles. A few small tubercles also occur within the petals and the frontal ambulacrum. The oral face is fully covered by smaller and denser primary tubercles, including the labral plate and the plastron (Fig. 8). Ambulacral zones have identical tuberculation to that in the interambulacral zones, with scattered primary tubercles, except in the phyllodes.

Fascioles - Absent in well preserved adult specimens. According to Mortensen (1950) the absence of an adproctal widening of the plates in the ambulacra I.a and V.b adjoining the episternal plates, typically confirms the absence of a subanal fasciole.

ETYMOLOGY. Dedicated to Giuseppe Lubelli (1938–2013), a collector from Cagliari who provided the authors with the first specimen of *Heterobrissus* found at Isili (Sardinia).

REMARKS. *Heterobrissus salvae* (Cotteau, 1890) differs by thicker shell and by the plates in the proximal part of the oral ambulacra I and V, which are longer and, as a consequence, the sternal plates extend only to the ambulacral plates 7–8, not to the plates 9–10 as in *H. lubellii*.

Heterobrissus lubellii n. sp. mainly differs from the Recent *H. hystrix* from the Caribbean area by lower test, periproct more inframarginal (Fig. 32), larger paired petals and much denser aboral tuberculation.

DISTRIBUTION. Late Oligocene-Early Aquitanian and Burdigalian of Sardinia.

Genus ***Echinopneustes*** n. gen. - Figs. 23–25, 28, 30, 34–38 - http://zoobank.org/ee07de29-90d8-4eed-8719-bdbc0653f7b5

TYPE SPECIES. *Palaeopneustes niasica* Döderlein, 1901 (p. 22).

TYPE MATERIAL. Döderlein (1901) did not designate a type. A syntype (MCZ.2817), dredged from Nias (Indonesia) during the Valdivia expedition, is housed at the Museum of Comparative Zoology, Harvard University (Downey, 1968).

DIAGNOSIS. Test ovate without anterior sulcus (Fig. 34); anterior convex, posterior face truncate. Test domed in profile, with flat base (Fig. 36). Apical disc ethmolytic, with four gonopores, anterior of centre. Anterior ambulacrum narrow, flush; pore-pairs minute adapically. Paired ambulacra petaloid adapically, most parallel-sided and largely open distally; enlarged pore-pairs extending almost to ambitus. No occluded plates at the end of petals. Peristome lunate with projecting labrum (Figs. 28, 35). Labral plate extending to the adjacent ambulacral plate 2 (Figs. 23–25). Perioral area sunken. Phyllodes well developed (Fig. 35, 38). Sternal, episternal and post episternal plates almost symmetrical, opposite rather than alternate; ambulacral plates not indenting the oral interambulacrum 5. Periproct large and flush, marginal to supramarginal, located rather high on the posterior test face (Figs. 30, 37), and bounded by the plates 5.a.5 and 5.b.5 in the oral posterior interambulacrum. Fascioles absent, at least in adult specimens. Aboral surface covered in coarse and heterogeneous tuberculation, made of scrobiculate, perforate and crenulate primary tubercles and numerous granules. Oral posterior ambulacra covered in tubercles behind phyllodes. Primary spines sharply pointed; in the type-species they are flattened and densely thorny, and only close to the base they may be round in section.

SPECIES INCLUDED. • *E. niasicus* (Doderlein, 1901): Recent, Indo-Pacific.

• *E. erinaceus* (Baker et Rowe, 1990); Recent, Australia.

• *E. gigas* (Baker et Rowe, 1990); Recent, Australia.

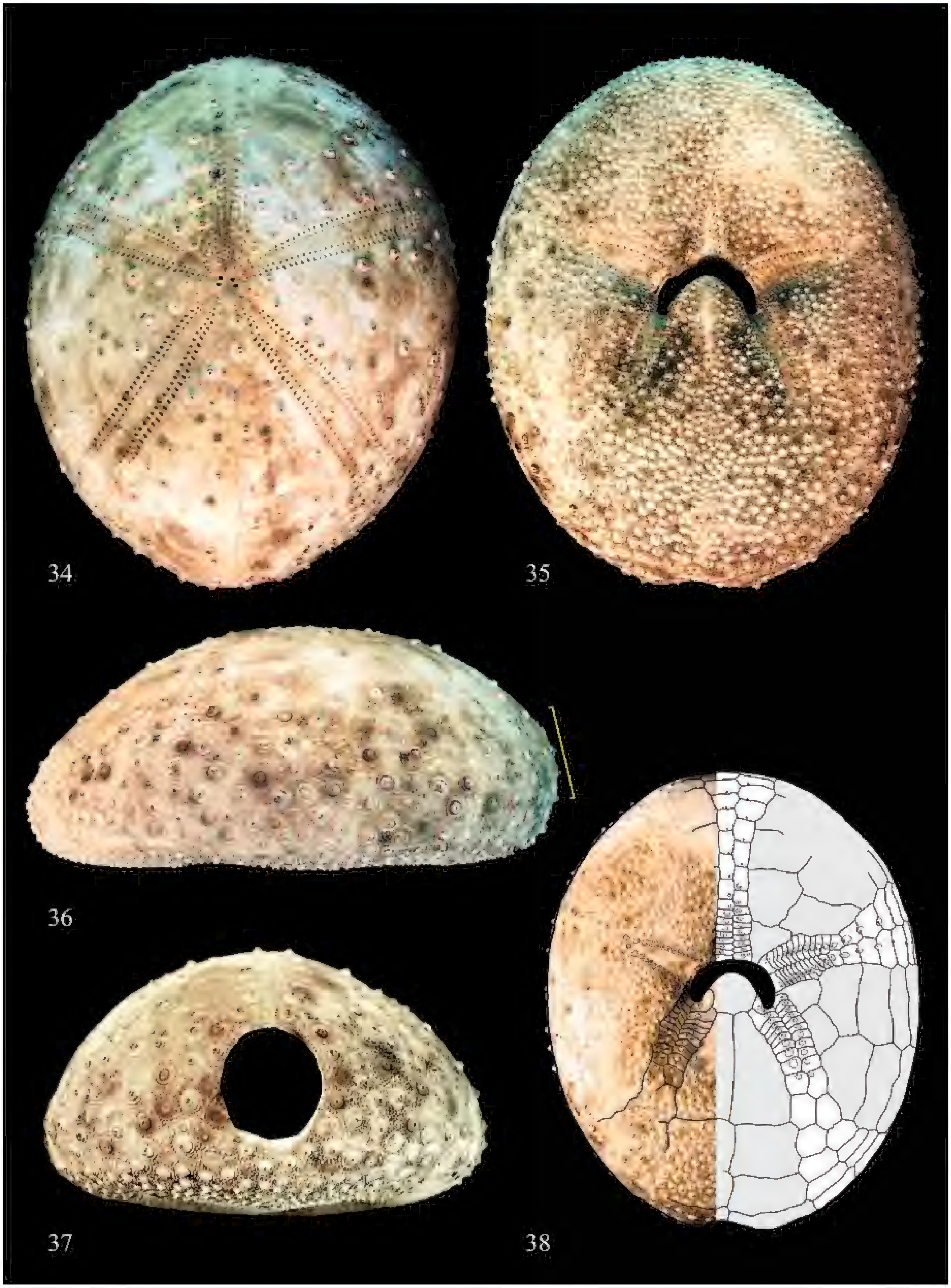
DISTRIBUTION. Recent, Indo-Pacific.

DIFFERENTIAL DIAGNOSIS. *Echinopneustes* n. gen. differs from *Heterobrissus* mainly in the labral plate being shorter and reaching only plate 2 of the adjoining ambulacra, instead of plate 3 as in *Heterobrissus*. Additionally, the test outline is not restricted posteriorly (Figs. 28, 35) and the posterior face is larger and steeper (Figs. 30, 36, 37), sometimes almost vertical, so that the periproct cannot be seen in oral view (Figs. 28, 35). The peristome is farther from the anterior margin of the test (Tables 2–3, Figs. 28, 35, 38). The periproct in the type-species is bounded by the interambulacral plates 5.a.5 and 5.b.5, not the 5.a.4 and 5.b.4 as in *Heterobrissus* (Fig. 38). In *Echinopneustes niasicus* the primary spines are thorny and flattened distally, whereas they are smooth and round in *H. hystrix* and round and finely striated in *H. montesi*. Ophicephalous pedicellarie are present, whereas they are absent in *H. hystrix*.

ETYMOLOGY. It derives from the Greek words echinos (sea urchin) and pneuma (breath), referring to the inflated shape of the test.

REMARKS. *Echinopneustes* n. gen. has no near relation with *Palaeopneustes*, in which the type species was originally placed by Doderlein (1901). In particular, the oral posterior ambulacra are highly characteristic in being wholly covered with large and small tubercles, not at all naked as it is otherwise usual in *Palaeopneustes* (Mortensen, 1950).

Echinopneustes erinaceus differs from *E. niasicus* by the presence of many short spines and the labrum longer than wide. *Echinopneustes gigas* differs from the other species attributed to *Echinopneustes* by its larger maximum size (TL up to 165 mm), coarser tuberculation, narrower phyllodes area and the presence of large short-bladed globiferous and rostrate pedicellariae (Baker & Rowe, 1990). A detailed key to distinguish among the Recent species attributed to this genus has been provided by Baker & Rowe (1990, p. 310).



Figures 34–38. *Echinopneustes niasicus* (Doderlein, 1901), MAC.IVM291, TL = 121 mm, Recent, Southern China Sea: respectively aboral, oral, lateral and posterior views, and oral plating scheme.

PALAEOECOLOGY

The presence of an outer shelf setting was prospected in the Pantano Fm at Jano, near Sasso Marconi (Panini et al., 2005), as well as in the Pakhna Fm of Cyprus (Smith & Gale, 2009). In both the examined areas, a low diversity fauna has been recorded. In particular, in the Serravallian of southern Cyprus the echinoid assemblage is dominated by just two genera of spatangoids, *Palaeobrissus* A. Agassiz, 1883 and *Heterobrissus*, both of them today confined to bathyal muddy settings (Smith & Gale, 2009). In the Langhian of Emilia-Romagna, *Heterobrissus* is commonly associated with *Mazettia pareti* (Manzoni, 1879) and *Faorina maullui* Stara et Borghi, 2012. According to Smith & Gale (2009), *Mazettia* is a probable sister taxon to *Linopneustes* A. Agassiz, 1881, which today lives in 55–710 m water depth, with maximum frequency between 200–500 m (Mortensen, 1950). *Faorina* Gray, 1851 today inhabits the Indo-Pacific at depths of 41–220 m, associated with *Echinopneustes niasicus* and *Linopneustes* spp. (Lane et al., 2000).

Heterobrissus montesi is closely related to *H. hystrix*, today living on muddy bottoms in the Caribbean, at 220–1610 m depth, (Mortensen, 1950; Serafy, 1979). Young et al. (1998) studied the distribution of *H. hystrix* and the thermal tolerances of its embryos and echinopluteus larvae. They found that embryos could tolerate temperatures as high as 25 °C, but larvae died at temperatures above 20 °C. The population of *H. hystrix* inhabiting the slopes of the Bahamian Islands had adult distributions centred at a depth of 550 m, with the upper limit corresponding closely to the thermal tolerances of larvae. At 200 m, in the Caribbean, the water temperature ranges from 15–16° along the northern Colombian coast to a maximum of 20–21° in the Cuba-Florida area.(Fuglister, 1954). At 1600 m, the maximum reported bathymetry for this species, the temperature is about 5 °C (NOOA data, 2009).

Heterobrissus is a large and flat-based echinoid with a heterogeneous aboral spine canopy and without fascioles. The lack of fascioles points to echinoids living epibenthic or inhabiting coarse permeable sediments (Smith & Stockley, 2005); the first hypothesis is more likely also for the fossil *Heterobrissus*, since groups of *H. hystrix* have been observed “patrolling” the bottom surface at the Bahamas Islands (NOAA Photo Library, 2009).

Based on the available evidence and on comparison with living sister taxa and their bathymetric ranges, *H. montesi* was en epibenthic echinoid, inhabiting muddy bathyal settings and harvesting organic detritus from the sediment-water interface.

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First record of the little-known land gastropod genus *Nobuea* Kuroda et Miyanaga, 1943 (Gastropoda Diplommatinidae) from Jeju Island, South Korea

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ABSTRACT *Nobuea* Kuroda et Miyanaga, 1943 (Gastropoda Cyclophoridae) is one of the least-known genera of terrestrial gastropods. An individual of this genus was collected from Jeju Island, South Korea, the first record of *Nobuea* from this island. Further studies are needed to investigate the taxonomic and conservation status of the Jeju *Nobuea* reported here.

KEY WORDS Conservation; nonmarine gastropods; insular biodiversity; new records; geographic distribution.

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INTRODUCTION

The genus *Nobuea* Kuroda et Miyanaga, 1943 (Gastropoda Diplommatidae) represents one of the least-known genera of land gastropods. There are two recognized species of this genus: *N. elegantistriata* Kuroda et Miyanaga, 1943 and *N. kurodai* Minato et Tada, 1978.

The first species was described based on a single specimen collected on Geomun Island, South Jeolla Province, South Korea (Kuroda & Miyanaga, 1943) and no living individual has been encountered at least for the last three decades (National Institute of Biological Resources, South Korea, 2012). In the Korean literature, few illustrations of *N. elegantistriata* occur, e.g., Kwon et al., (1993; 2001), Min et al., (2004) and Lee & Min (2005). The illustration in Kwon et al., (2001) is repeated in the two subsequent publications. *Nobuea kurodai* was recorded from Tushima-cho, Ehime Prefecture, Japan (Minato & Tada, 1978) and, subsequently, an additional population was found on Mt. Kamon, Miyazaki Prefecture, Japan (Minato & Nishi, 1996).

At present, as far as we know, only five individuals of this species have been reported (four from the type locality and one from the second population). Because of the low population densities and/or restricted distributions, both *Nobuea* species are listed in national level red data books (National Institute of Biological Resources, South Korea, 2014; Ministry of Environment, Japan, 2019).

Jeju Island is the largest island in South Korea, with an area of about 1800 km^2, and is situated about 80 km south of the Korean peninsula. The non-marine gastropod fauna of this island has been relatively well examined (e.g., Habe & Kosuge, 1970; Noseworthy et al., 2007). At present, 52 species of land snails and eight freshwater snails have been recorded from Jeju Island (Habe & Kosuge, 1970; Joo et al., 1979; Noseworthy et al., 2007; Kimura et al., in press).

MATERIAL AND METHODS

On 10 October 2018, a field survey was conducted, and a single specimen of the genus *Nobuea* was collected at the parking lot of Geolmae Eco Park, Seogwipo, Jeju Special Self-governing Province (33°14’53.9”’N 126°33’15.1”E) (Fig. 1). Its shell was examined under a light microscope. Because the specimen was preserved in 100% ethanol soon after being collected, the details of its anatomy were not obtained. The examined specimen was deposited in the personal collections of K. Kimura (Voucher No: MNKS2551)

RESULTS AND DISCUSSION

Systematics

Phylum MOLLUSCA Cuvier, 1797
Classis GASTROPODA Cuvier, 1795
Subclassis CAENOGASTROPODA Cox, 1960
Ordo ARCHITAENIOGLOSSA Haller, 1890
Superfamilia CYCLOPHOROIDEA Gray, 1847
Familia DIPLOMMATINIDAE Pfeiffer, 1857
Genus *Nobuea* Kuroda et Miyanaga, 1943

Nobuea sp.

DESCRIPTION. Shell small, strongly depressed, thin, rather dull white. Measurements: height 1.8 mm, width 4.0 mm (Fig. 2, Voucher No: MNKS2551).Whorls three, with regularly increasing diameter. Protoconch with 1½ whorls, with smooth, glossy surface. Teleoconch finely rib-striated at irregular intervals, lower whorls more densely than upper ones. Ribs not parallel; spiral striae absent. Aperture circular, slightly oblique. Periphery round. Suture deep. Umbilicus wide and

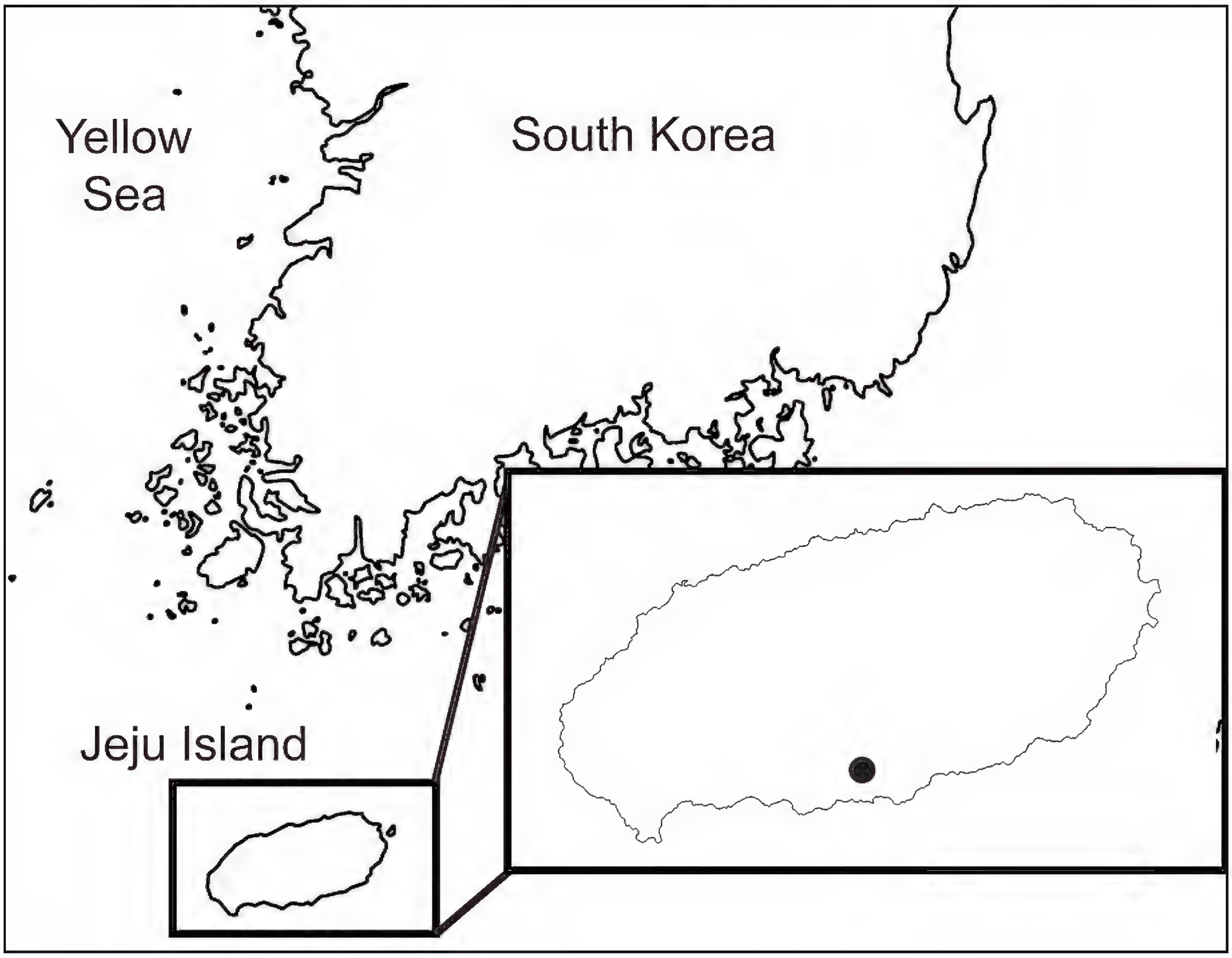

Figure 1. Sample collection locality in Jeju Island, South Korea.

deep, showing the upper whorls within. Operculum circular, thin, not calcareous, with multiple spiral lines.

Distribution and Biology. The genus *Nobuea* is known from two Korean islands (Geomun and Jeju Islands) and western Japan (Ehime and Miyazaki Prefectures). There is few information on the ecology and life history of this genus.

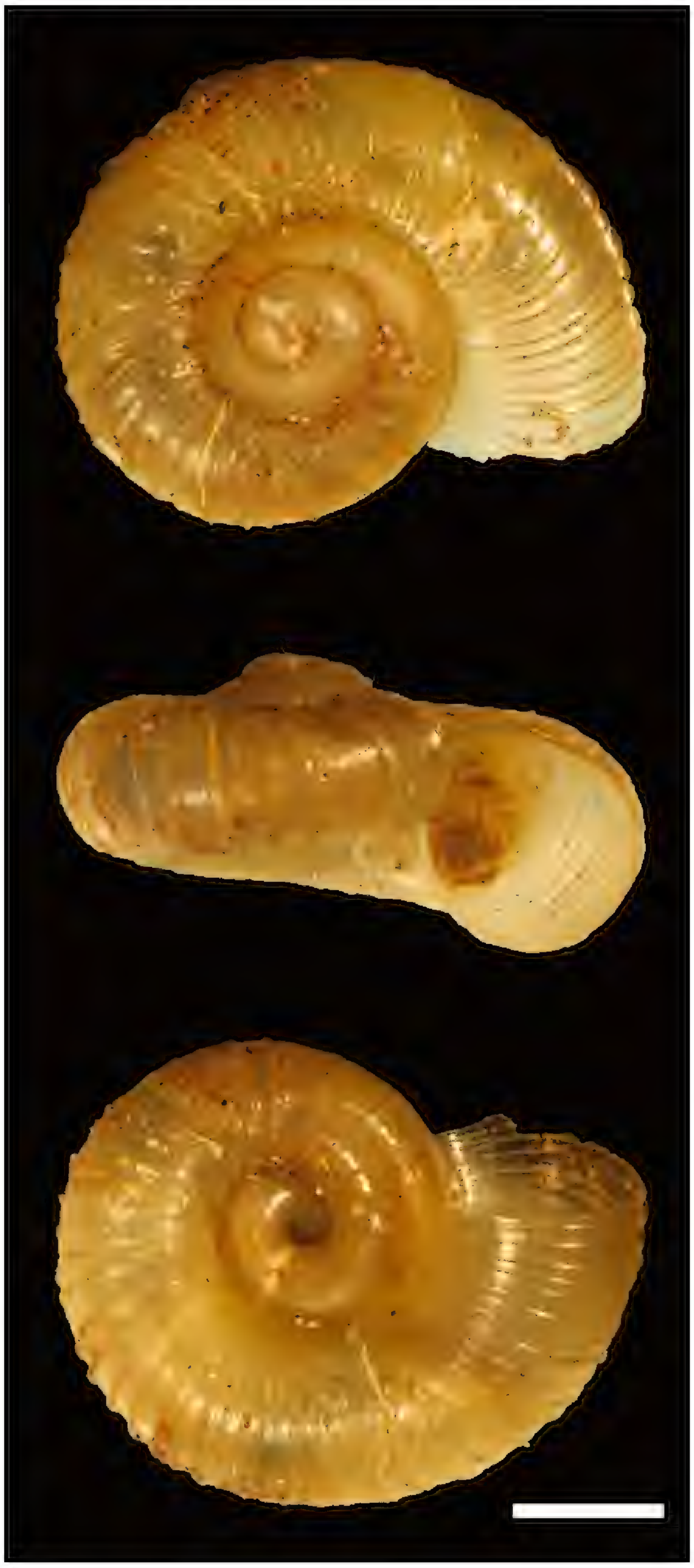

Figure 2. Shell of the *Nobuea* specimen collected on Jeju Island. Scalebar: 1.0 mm.

Remarks. The specimen examined here was probably an immature individual, and therefore adult shell size, shape, and anatomy of mature individuals remain to be elucidated. However, the specimen exhibited distinct differences from the two other *Nobuea* species. The Jeju *Nobuea* has a flatter shell, with fewer and more prominent ribs on its shell surface than found in *N. elegantistriata* and *Nobuea kurodai*. In addition, the Jeju *Nobuea* can be distinguished from *N. elegantistriata* by its larger shell size. Further studies using additional adult specimens are needed to confirm the taxonomic status of this *Nobuea*. It should be noted that the taxonomic position of the genus *Nobuea* is still controversial (Kwon et al., 1993; Azuma, 1995; Minato & Nishi, 1996). Although the original description by Kuroda & Miyanaga (1943) places *N. elegantistriata* in Diplommatinidae, Kwon et al., (1993) include it in the Alycaeidae. Subsequently, Minato & Nishi (1996) and more recent publications regard the genus *Noubea* as a member of the Cyclophoridae. In this study, we placed the genus in Diplommatinidae in accordance with Kuroda & Miyanaga (1943).

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New *Carabus* Linnaeus, 1758 from China and Vietnam and description of the male of *Carabus* (*Pseudocoptolabrus*) *chortenensis* Cavazzuti, 2005 (Coleoptera Carabidae)

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ABSTRACT

Four new subspecies of genus *Carabus* Linnaeus, 1758 (Coleoptera Carabidae) belonging to subgenus *Apotomopterus* and one new *Carabus* subspecies belonging to subgenus *Pseudocoptolabus* are described and figured. Two of these are originally from the southeastern part of Sichuan province (China): *Carabus* (*Apotomopterus*) *kassandra planielongatus* n. ssp. and *Carabus* (*Apotomopterus*) *benardi alterego* n. ssp.; one from Hunan province (China): *Carabus* (*Apotomopterus*) *cyanipennis atripennis* n. ssp.; one from Northeast Yunnan province (China): *Carabus* (*Pseudocoptolabrus*) *taliensis xerophilous* n. ssp.; one from Ha Giang province (Vietnam): *Carabus* (*Apotomopterus*) *tonkinensis hagiangensis* n. ssp. *Carabus* (*Pseudocoptolabrus*) *chortenensis* Cavazzuti, 2005 is considered as a valid species after examination of a male specimen from its type locality; the male imago and aedeagus are described and figured for the first time. *Carabus* (*Pseudocoptolabrus*) *chortenensis mosso* Deuve et Mourzine, 2005 comb. nov.

KEY WORDS *Carabus*; *Apotomopterus*; *Pseudocoptolabrus*; taxonomy; Sichuan; Hunan; Yunnan; Ha Giang; China; Vietnam.

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INTRODUCTION

I recently had the opportunity to examine a large series of carabid beetles collected in China (Sichuan, Yunnan and Hunan provinces) and from the Northernmost part of Vietnam. Among the studied specimens, I identified five new subspecies of genus *Carabus* Linnaeus, 1758 (Coleoptera Carabidae) clearly different from all the hitherto known subspecies of each species. Four new subspecies belonging to subgenus *Apotomopterus* Hope, 1838: *Carabus* (*Apotomopterus*) *kassandra planielongatus* n. ssp.; *C.* (*Apotomopterus*) *benardi alterego* n. ssp.; *C.* (*Apotomopterus*) *cyanipennis atripennis* n. ssp.; *C.* (*Apotomopterus*) *tonkinensis hagiangensis* n. ssp.; and one new subspecies belonging to subgenus *Pseudocoptolabus* Reitter, 1896: *C.* (*Pseudocoptolabrus*) *taliensis xerophilous* n. ssp. The study of one male of *Carabus* (*Pseudocoptolabrus*) *chortenensis* Cavazzuti, 2005 collected in its type locality gave me the opportunity to confirm its validity as a species.

RESULTS

Systematics

Carabus (Apotomopterus) kassandra planielongatus n. ssp. - Fig. 1 - http://zoobank.org/67ab6c74-0790-4358-b34a-04558dfd1686

EXAMINED MATERIAL. Holotype female, China, Southeast Sichuan province, Leibo, 50 km South from Shanlinggangxiang, VI.2019, Wang legit. The holotype is temporarily housed at the author's collection in Cialla di Prepotto (Udine, Italy) waiting to be definitively deposited in a public Institution.

DESCRIPTION OF THE HOLOTYPE. Length including mandibles: 37 mm, elytra width: 11.5 mm. Upper surface black with a very faint violet luster on the edges of elytral. Ventral surface, legs, palpi and antennae totally black.

Head narrow and elongate, long neck, eyes prominent. Front quite flat and very faintly punctured, vertex and neck strongly wrinkled. Mandibles long with a very acuminate apex. Palpi thin and very long; preapical segment of the labial palps with three setae. Antennae long and very thin, extending the half of the elytra.

Pronotum strongly sinuated, moderately transverse (about 1.15 times as broad as long); flat disc; sides of pronotum fully margined, slightly bent upwards; hind angles very short but acuminate, strongly bent downwards; surface of pronotum strongly punctured-rugulose. Elytra of very elongated oval shape, slender; quite flat disc; shoulders very narrow; sculpture of perfect triploid homodyname type; intervals very convex; primary intervals forming chains of quite short segments interrupted by small foveae, secondary and tertiary interval uninterrupted; sculpture gradually more rough and irregular towards the apex of elytra; whole margins of elytra strongly margined and bent upwards; preapical indentation strong, forming a rounded tooth. Very long and thin legs.

ETYMOLOGY. The name refers to the unusually elongate and flat habitus of the subspecies.

REMARKS. The new subspecies differs from *C.* (*Apotomopterus*) *kassandra kassandra* Kleinfeld 1999 because of the very thin antennae; the narrower and cordate shape of pronotum; the longer and flatter shape of elytra, the roughly and convex elytral sculpture especially in the apical third; the elytral sides fully margined and bent upwards from the shoulders to the preapical indentation; stronger preapical indentation of elytra.

Carabus (Apotomopterus) benardi alterego n. ssp. - Fig. 2 - http://zoobank.org/67f34005-ec2d-4a05-b42b-1d583923ed6a

EXAMINED MATERIAL. Holotype female, China, Southeast Sichuan province, Leibo, 50 km South from Shanlinggangxiang, VI.2019, Wang legit. The holotype is temporarily housed at the author's collection in Cialla di Prepotto (Udine, Italy) waiting to be definitively deposited in a public Institution. Paratype: 1 female, same data as holotype in Albert Rautenstrauch collection (Augsburg, Germany).

DESCRIPTION OF THE HOLOTYPE. Length including mandibles 38 mm, maximum width of elytra: 12.8 mm. Upper surface uniformly black, shiny. Ventral surface, legs, palpi, antennae, and mandibles black.

Head of medium size; head surface strongly punctured and very strongly wrinkled, front smooth. Eyes of hemispheric shape. Very long and thin palpi, penultimate segment of the labial palpi with three-setae. Long antennae protruding beyond the half of the elytra.

Pronotum sinuated, slightly transverse (1.22 times as broad as long); sides uniformly margined and very slightly bent upwards; hind angles very few protruding behind the base; surface of pronotum strongly and uniformly rougly punctured.

Elytra of elongate shape, maximally dilated at the apical third; very strong preapical indentation, preapical tooth very long and acuminate; shoulders narrow and rounded; quite flat profile. Sculpture of elytra perfect homodyname triploid type; intervals convex and very regular, not sinuated; primary intervals forming quite long links interrupted by foveae; secondary and tertiary forming uninterrupted costae. Legs exceptionally long.

ETYMOLOGY. The name wants to emphasise the very strong morphological similitude with the syntopic species *C.* (*Apotomopterus*) *kassandra planielongatus* n. ssp.

REMARKS. The new subspecies is closely related to *C. (Apotomopterus) benardi briseis* Rapuzzi, 2018 but: smaller and sinuate pronotum; body more elongate and somewhat flatter; elytral sculpture of homodyname type. It is interesting to note that the new subspecies is syntopic with *C. (Apotomopterus) kassandra planielongatus* n. ssp., the two species are morphologically very similar (sister species), but easily distinguish by stronger preapical indentation of elytra in *C. (Apotomopterus) benardi alterego* n. ssp.

VARIABILITY. The paratype has no substantial morphological differences with the holotype.

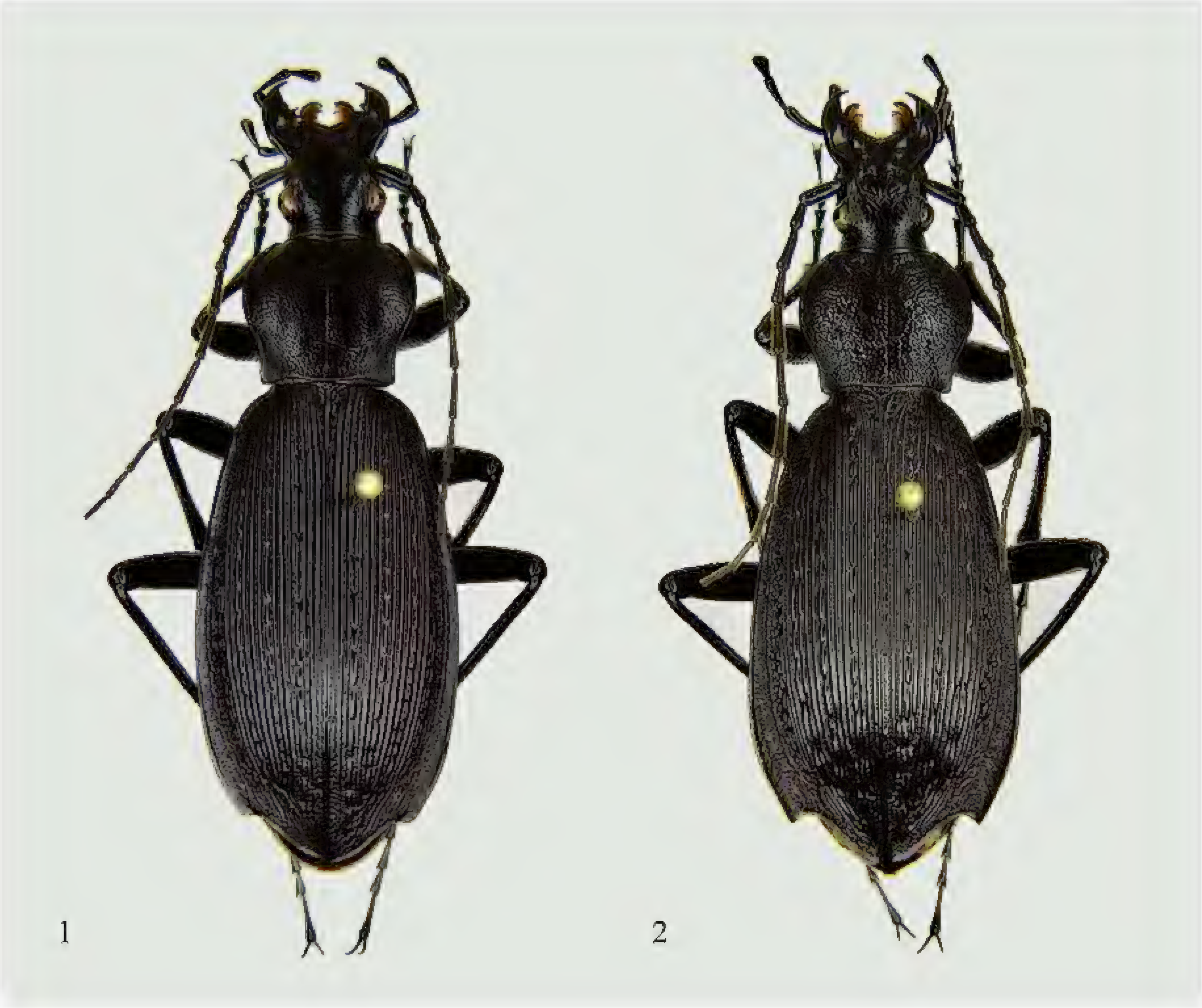


Figure 1. *Carabus* (*Apotomopterus*) *kassandra planielongatus* n. ssp., holotype.
Figure 2. *Carabus* (*Apotomopterus*) *benardi alterego* n. ssp., holotype.

Carabus (Apotomopterus) cyanipennis atripennis n. ssp. - Figs. 3–5 - http://zoobank.org/845a5e85-5740-4782-84ef-7c94ac91600c

EXAMINED MATERIAL. Holotype male, China, Guangxi province, Yuecheng Ling, 1800 m, 1/16.V.2008, V. Siniaev legit. The holotype is temporarily housed at the author's collection in Cialla di Prepotto (Udine, Italy) waiting to be definitively deposited in a public Institution. Paratypes: 4 males and 10 females, same data as holotype in the author's collection and in Albert Rautenstrauch collection (Augsburg, Germany).

DESCRIPTION OF THE HOLOTYPE. Length including mandibles 32 mm, maximum width of elytra: 10 mm. Colour uniformly slate black, shiny. Ventral side, legs, palpi, antennae, black; mandibles black with brownish base.

Head of medium size; very short neck; head surface faintly punctured and superficially wrinkled, front smooth. Eyes very big of hemispheric shape. Very long and thin palpi, penultimate segment of the labial palpi with three-setae. Very long antennae trespassing behind the half of the elytra.

Pronotum quite small and slightly transverse (1.12 times as broad as long), and slightly cordate; hind angles rounded, very few protruding behind the base and bent downwards; disc flat; surface of pronotum uniformly wrinkled.

Elytra very elongate; shoulders narrow and rounded; convex profile. Sculpture of elytra triploid homodyname type; all the intervals are convex; primary intervals forming short links interrupted by foveae; secondary and tertiary of the same size forming uninterrupted costae; punctured striae.

Male aedeagus typical of the species but: stronger with the apical portion of median lobe much shorter and larger in frontal view (Fig. 4); in lateral view (Fig. 5) the apex is stout and strongly curved on the left.

Etymology. The name wants to point out the unusual black colour without any blue-violet lustre.

Variability. The size ranges from 28 to 32 for the males and from 29 to 34 for females. Some specimens are black with a faintly cupper-brownish lustre. The elytra of females are larger and dilated with a very strong preapical indentation, preapical tooth very long and acuminate.

Remarks. The new subspecies differs from *C. (A.) cyanipennis cyanipennis* Breuning, 1932 (including its subspecies) for the larger size, the color black without any blue-violet luster, the smaller and somewhat more cordate pronotum, the shape of male aedeagus and the stronger preapical indentation of the females. The elytral sculpture is stronger with intervals larger and more convex, the striae are punctured.

Carabus (Apotomopterus) tonkinensis hagiangensis n. ssp. - Figs. 6–10 - http://zoobank.org/f5a6d29d-6c87-45e3-8f6b-09e6da00b1b9

Examined material. Holotype male, Vietnam, Ha Giang province, Lung Cu, 1600m, IV.2019, local collector leg. The holotype is temporarily housed at the author's collection in Cialla di Prepotto (Udine, Italy) waiting to be definitively deposited in a public Institution. Paratype: 2 females, same data as holotype in the author's collection and in Albert Rautenstrauch collection (Augsburg, Germany).

Description of the holotype. Length including mandibles: 30.5 mm, maximum width of elytra: 9 mm. Dorsal side black, mat. Ventral side, legs, antennae and palpi black.

Head of medium size, quite long and strong; eyes big and convex; front nearly flat and smooth, vertex of the head very faintly and sparsely punctured, neck faintly wrinkled. Mandibles short and strong. Very long and thin palpi; preapical segment of the labial palps with three setae. Antennae very long and thin, extending over the half of the elytra.

Pronotum elongated, very slightly transverse (1.05 times as broad as long); cordate shape; hind angles of pronotum rounded, protruding behind its base; sides of pronotum fully margined and fully bent upwards; disc slightly convex; surface of pronotum uniformly wrinkled and punctured.

Elytra of oval elongated shape; disc quite convex; rounded shoulders; triploid eterodyname type of sculpture of elytra: primary intervals very convex, forming costae interrupted by large foveae only from the apical half of the elytra; secondary forming very wake costae with grains; tertiary forming range of grains. The male aedeagus is typical of the species but median lobe in general longer and stronger, strongly curved at the apex in frontal view (Figs. 7, 8).

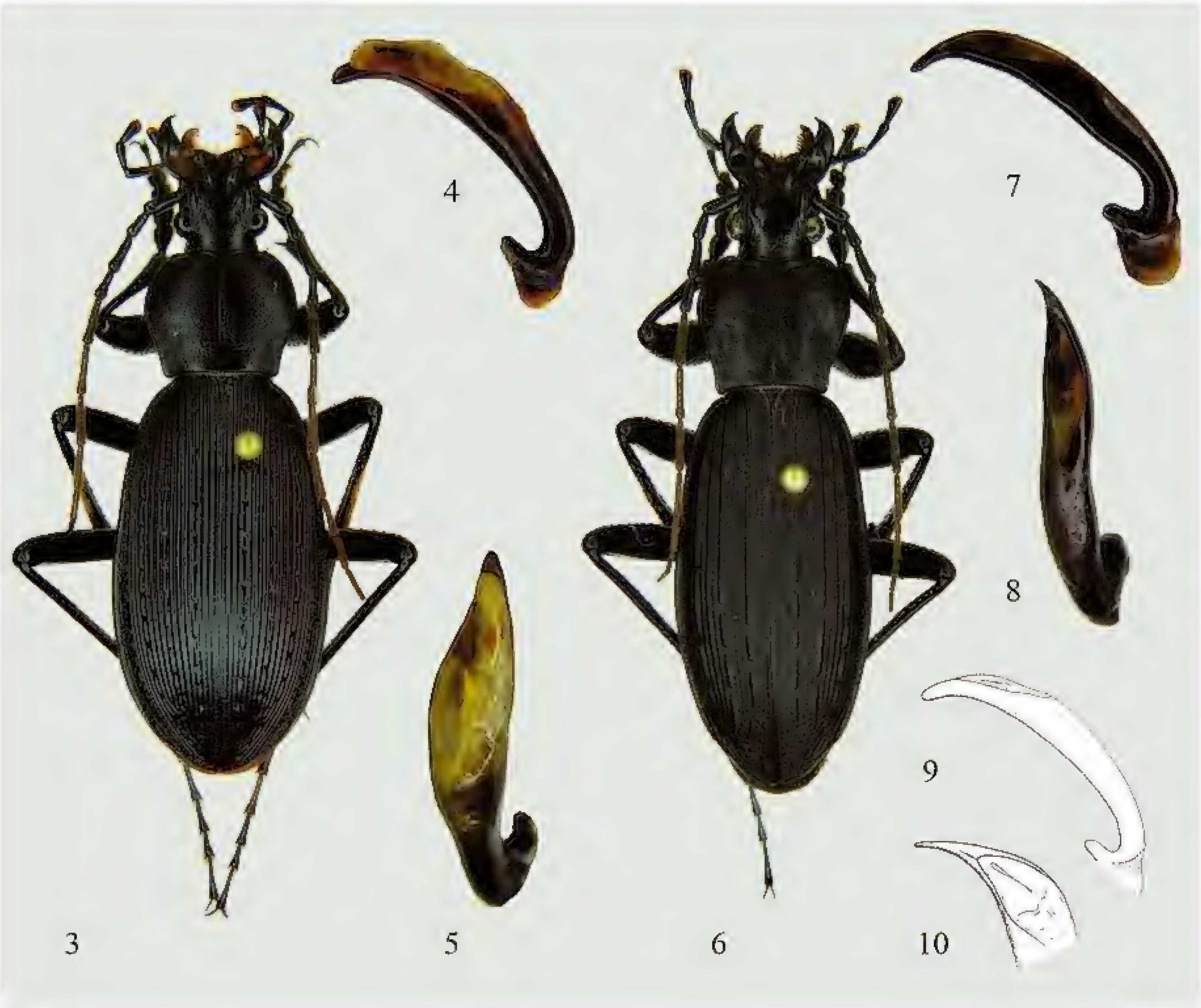
Etymology. The new subspecies is named after the province of Ha Giang (Vietnam).

Variability. Very small variability: the size of females ranges from 30.5 to 32 mm.

Remarks. The new subspecies is morphologically closest to *C. tonkinensis yenbaiensis* Deuve, (2013) but: head proportionally larger; stronger mandibles; hind angles of pronotum larger and rounded, longer protruding behind the pronotal base; sides of pronotum stronger bent upwards especially in the apical part; sculpture of elytra characterized by secondary and tertiary intervals less convex; elytra of the female with stronger and more acuminate preapical indentation; median lobe of male aedeagus longer and stronger, strongly curved at the apex in frontal view (compare figure 7 and figure 8 with figure 9 and figure 10). The type locality of *C. tonkinensis hangiangensis* n. ssp. is more on the East and it is separate from *C. tonkinensis tonkinensis* Deuve (1990) (including *imurai* Gottwald, 1991) and *C. tonkinensis yenbaiensis* by the plane of the Red River Valley (Sōng Hóng River).

Carabus (Pseudocoptolabrus) taliensis xerophilous n. ssp. - Fig. 11 - http://zoobank.org/2d 45b4f4-a47a-45d3-90b5-ba6e3ab0d980

Examined material. Holotype female, NE Yunnan, Dahai Xiang, VII.2019, Wang legit. The holo-



Figures 3–5. *Carabus* (*Apotomopterus*) *cyanipennis atripennis* n. ssp. Fig. 3: holotype. Fig. 4: paratype male, aedeagus in lateral view. Fig. 5: paratype male, aedeagus in dorsal view. Figures 6–8. *Carabus* (*Apotomopterus*) *tonkinensis hagiangensis* n. ssp. Fig. 6: holotype. Fig. 7: paratype male, aedeagus in lateral view. Fig. 8: paratype male, aedeagus in dorsal view. Figures 9, 10. *Carabus* (*Apotomopterus*) *tonkinensis yenbaiensis* Deuve, 2013. Fig. 9: male aedeagus in lateral view, original draw by Deuve, 2013. Fig. 10: idem, male aedeagus in dorsal view, original draw by Deuve, 2013.

type is temporarily housed at the author's collection in Cialla di Prepotto (Udine, Italy) waiting to be definitively deposited in a public Institution.

DESCRIPTION OF THE HOLOTYPE. Length including mandibles: 34.5 mm, maximum width of elytra: 11 mm. Dorsal side totally black without any metallic lustre, mat. Ventral side, legs, antennae and palpi black. Thickened head, neck nearly large as the base of pronotum; small eyes, moderately prominent; head surface punctured and faintly rugulose only over the supraocular sulcus. Mandibles long and strong, regularly curved. Long palpi; apical segment of maxillary and labial palpi dilated; sub apical segment of labial palpi multi setose. Antennae short, very thin, extending the pronotal base with 5 articles.

Narrow pronotum (0.95 times as broad as long), slightly sinuated; hind angles of pronotum very few protruding behind the base, strongly bent downwards; surface of pronotum uniformly granulose.

Oval shape of elytra, elytral disc very convex; shoulders salient. Elytral sculpture triploid eterodyname type, strongly irregular but moderately roughly among the other *C. (Pseudocoptolabrus) taliensis* Fairmaire, 1886 forms; the primary tubercles are distinct but not very convex, separated by rounded and quite deep foveae; secondary and tertiary intervals are indistinct fused in a single intermediate zone of grains.

Legs short and quite strong for the species.

ETYMOLOGY. The name wants to emphasise the dry environment of the type locality where the new subspecies lives.

REMARKS. *Carabus (Pseudocoptolabrus) taliensis* is a montane species inhabiting high altitude forests of the alpine zone with a clear preference for cold and wet places. The species is widespread in southwestern China where forming isolated populations, as a result about 30 different subspecies are known (Imura, 2018). *Carabus (Pseudocoptolabrus) taliensis xerophilous* n. ssp. seems to be endemic on the Dahai Mountains and it is one of the South-easternmost population of the species, despite the usual occurrence of the species in wet places the new subspecies inhabits dry stony meadows with tall grass, where it seems to be very rare.

Morphologically, the new subspecies is close to *Carabus taliensis jiaozicola* Deuve (2019) but: wider and thickened shape, shorter hind angles of pronotum, stronger and roughly elytral sculpture. Geographically, the new subspecies lives more on the East on a peripheral mountain range separated by the deep valley of Xiao Jang River.

Carabus (Pseudocoptolabrus) chortenensis Cavazzuti, 2005 *bona species* (Fig. 12–14)

Carabus (Pseudocoptolabrus) firmatus subsp. *chortenensis* Cavazzuti, 2005

DESCRIPTION OF THE MALE of *C.* (*Pseudocoptolabrus) chortenensis*. Length including mandibles 34.5 mm, maximum width of elytra: 10.5 mm. Colour: head and pronotum black with quite intense blue-violet lustre; elytra uniformly black, shiny; ventral side, legs, palpi, antennae, and mandibles black.

Head elongate, moderately ticked; surface faintly punctured and superficially wrinkled, frons smoother. Mandibles very long and narrow, evenly curved. Long and quite thin palpi; apical segment of maxillary and labial palpi dilated; sub apical segment of labial palpi with three-four setae. Antennae very long and thin, extending to the half of elytra.

Pronotum elongated, not transverse (as broad as long), strongly cordate with the maximum wide at the anterior third and very narrowed before the base; hind angles strongly divergent and slightly prominent; upper surface of pronotum uniformly punctured.

Elytra very elongate but strong and very convex; shoulders narrow and rounded. Very strong sculpture of elytra: primary tubercles very convex, irregularly interrupted by deep foveae, secondary and tertiary forming grains very convex and irregularly disposed between the primary intervals.

Legs very long but quite strong. The 4th protarsal segment not dilated, without adhesive sole.

Male aedeagus in lateral view (Fig. 13) and in dorsal view (Fig. 14)

REMARKS. Cavazzuti (2005) described on the basis of a single female specimen the taxon "*chortenensis*" as a subspecies of *C.* (*Pseudocoptolabrus*) *firmatus* Cavazzuti (1997). Subsequentially, *C. chortenensis* was considered as a subspecies of *C. taliensis* by Deuve (2013a) and Imura (2018). Recently, I had the opportunity to study a male specimen of "*chortenensis*" collected in its type locality. (see above) and I propose to consider "*chortenensis*" as a different species separated from *C. firmatus* and *Carabus taliensis* (Fairmaire, 1886).

Carabus chortenensis is syntopic with *C. taliensis stupaensis* Cavazzuti, 1996 and easily distinguished from it by the various strong characters already highlighted by Cavazzuti (2005). Morphologically, *C. chortenensis* is close with *C. firmatus* but it is different because of: head larger with a smoother sculpture (faintly punctured in *chortenensis* while it is strong wrinkled in *firmatus*); pronotum larger, strongly cordate, surface slightly punctured and not wrinkled; elytra stronger and more convex, sculpture strongly irregular; shorter and stronger legs, protarsal segments strongly dilated; different shape of male aedeagus (in general larger and stronger, the apex is of tooth shape in chortenensis and of spatula shape in firmatus). For all the above mentioned characters I propose to consider *C. chortenensis* as a separate valid species.

Few months after the description of *C. (Pseudocoptolabrus) firmatus* subsp. *chortenensis (*Cavazzuti, 2005), Deuve & Mourzine (2005) described *Carabus (Pseudocoptolabrus) taliensis mosso*

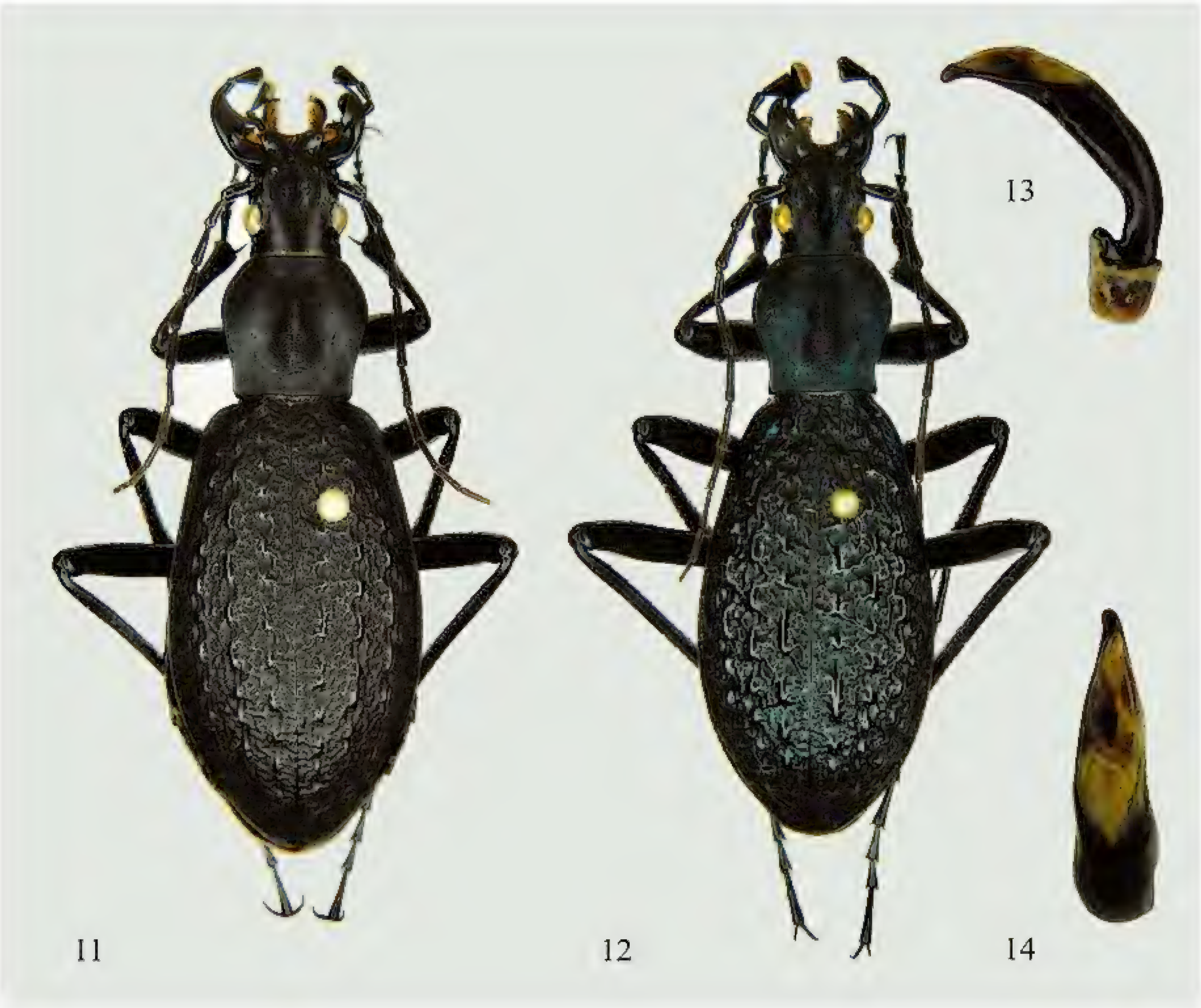


Figure 11. *Carabus* (*Pseudocoptolabrus*) *taliensis xerophilous* n. ssp., holotype. Figures 12–14. *Carabus* (*Pseudocoptolabrus*) *chortenensis* Cavazzuti, 2005. Fig. 12: male. Fig. 13: aedeagus in lateral view. Fig. 14: aedeagus in dorsal view.

which is morphologically and geographically closely related with *C. chortenensis* as highlighted by the Author in the original paper. For this taxon I propose the following new combination: *Carabus (Pseudocoptolabrus) chortenensis mosso* Deuve et Mourzine, 2005 *comb. nov.*

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Preliminary contribution to a revision of the Chilean Ceratocanthinae (Coleoptera Hybosoridae) with description of two new species of *Martinezostes* Paulian, 1982

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ABSTRACT Two new species of Ceratocanthinae (Coleoptera Hybosoridae) from Central Chile are described, i.e. *Martinezostes barrigai* n. sp. and *Martinezostes poqui* n. sp. Remarks are provided on *Martinezostes ruizi* (Gutiérrez, 1946), a species which till now has been misinterpreted. A key to the new species is provided as well as images of habitus of the adults and the aedeagi.

KEY WORDS Taxonomy; Neotropical region; Cerro Poqui; Altos de Vilches.

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INTRODUCTION

The fauna of Ceratocanthinae (Coleoptera Scarabaeoidea Hybosoridae) of Chile is currently comprised of four species ranged into two genera: *Germarostes posticus* (Germar, 1843) and *Martinezostes asper* (F. Philippi, 1859), *M. fortecostatus* (Gutiérrez, 1949) and *M. ruizi* (Gutiérrez, 1946) (Ocampo & Ballerio 2006). These four species were keyed by Gutiérrez (1949). In his revision of South American Ceratocanthinae, Paulian (1982), while establishing the genus *Martinezostes* Paulian, 1982 was however unable to examine the types kept in Chilean collections, therefore his revision contains some mistakes and, as a result, some species have been misinterpreted. With the aim to clarify the diversity and distribution of the Ceratocanthinae in the area, a revision of the Chilean fauna is in progress, which will also assess the validity of the genus *Martinezostes* and the generic placement of *G. posticus*. The purpose of this preliminary note is to describe two new species, which are placed in the genus *Martinezostes*.

MATERIAL AND METHODS

Methods and terminological conventions follow Ballerio & Grebennikov (2016) and references therein quoted. Label data are provided verbatim, with a slash to separate labels for holotypes only. Photographs of the habitus were taken with a Canon Eos D5 MII with a macro objective MP 65 mm, while photographs of the male genitalia were taken with a Canon Eos D5 MII connected with a phototube to a Leica MZ 12.5 stereoscope. Multi-layer images were then assembled using Helicon Focus software and cleaned and unmasked using a photo processing software. Geographic coordinates of the collecting sites where recorded using Google Earth Pro. The distribution map was generated with www.simplemappr.net.

ABBREVIATIONS AND ACRONYMS. EL: maximum elytral length; EW: maximum total elytral width; HL: maximum head length; HW: maximum head width; L: length; PL: maximum pronotal length at middle; PW: maximum pronotal width at middle; W: width.

ABCB: Alberto Ballerio collection, Brescia, Italy. BMNH: The Natural History Museum collection, London, United Kingdom. FMNH: Field Museum of Natural History collection, Chicago, U.S.A. FRFC: Francisco Ramírez collection, Santiago, Chile. JMEC: José Mondaca collection, Villa Alemana, Chile. MNNC: Museo Nacional de Historia Natural collection, Santiago, Chile. MZUC: Museo de Zoología collection, Universidad de Concepción, Concepción, Chile. JEBC: Juan Enrique Barriga collection, Curicó, Chile.

RESULTS

Systematics

Martinezostes barrigai n. sp. - Figs. 1–5, 16, 19, 21 - http://zoobank.org/2683 acbf-cc23-4aae-b9b5-e0eddeb4d9e4

EXAMINED MATERIAL. Type series. Holotype male in MNNC: / ALTO VILCHES Prov. Talca 13, 18-Nov. 1972 / Coll: L. Alvarez L. Cartagena / Holotype male *Martinezostes barrigai* n. sp. des. Ballerio & Mondaca /. Paratypes (27 specimens): 1 (MNNC): Alto Vilches - Prov. Talca, 13, 18-Nov-1972, coll: L. Alvarez / L. Cartagena; 2 (1 JMEC, 1 MNCC): Chile - Reg. Maule, Altos de Vilches, 25/29.I.2006, col. C. Fortino; 1 (JMEC): Chile, Prov. Talca, Altos de Vilches 1200 m, 2.XII.1999, col. M. Guerrero; 2 (1 JMEC, 1 MNNC): Chile, Reg. Maule, Altos de Vilches, 17.XII.2006, col. P. Pinto; 2 (JMEC): Provincia de Talca, Vilches Alto, 2.XI.2012, leg. Carlos Vidal; 3 (CJME): Chile, Reg. Maule, Altos de Vilches, 21.XI.2014, col. G. Aceituno; 1 (FRFC): Altos de Vilches, Talca, VII Reg., 28-NOV-1997, 1400 mts, leg. F. Ramírez; 1 (ABCB) (elytra only): Chile - Talca: Vilches Alto, Pantano de Vilches, 5.I.2014, leg. A. Ballerio; 1 (JEBC): Chile: Vilches Alto, Talca, 1200 mts., 19–29.XII.1972, coll. P. Vidal; 1 (JEBC): Malcho - Parral, Linares - Chile, 10.XI.93; 2 (JEBC): Chile prov. Curicó, 20 KM E. Potrero Grande, El Relvo, 25 mar 2004 (pitfall), leg. J.E. Barriga, S 36°11'1" W70° 56'1; 1 (FMNH): Prov. Talca, Alto Vilches, 17–24 de octubre de 1964, coll. L.E. Peña; 4 (FMNH): Vilches Alto, Talca, 1200 mts. / 19–29.XII.1972, coll. P. Vidal (ex coll. Peña); 1 (BMNH): Talca, Altos de Lircay, 21-30.XI.2003; 4 (1 MNNC, 3 ABCB): Chile, Reg. Maule, Altos de Vilches, 11.XII.2016, col. G. Aceituno.

DIAGNOSIS. Because of the combination of wrinkled pronotum and wide and smooth interstriae, lacking any pseudostriae, this new species of *Martinezostes* can be mistaken only with *M. ruizi*. It differs from *M. ruizi* in having the striae which are more regular (almost straight and continuous), whereas in *M. ruizi* they are more irregular. Moreover, the proximal and median third of elytra of *M. barrigai* n. sp. (including the humeral area) has some irregular weak tubercles on the interstriae, whereas in *M. ruizi* all tubercles are limited to the distal third of elytra (where they are less developed than in *M. barrigai* n. sp.) or to the striae beyond the sixth.

DESCRIPTION. HL 0.75 mm; HW: 1.51 mm; PL: 1.70 mm; PW: 2.75 mm; EL: 3.10 mm; EW: 2.75 mm. Medium sized flightless Ceratocanthinae. Body moderately convex, dorsum glabrous (20x), shiny, black; underside, tarsi and antennae reddish-brown, setation yellowish. Head: W/L ratio= 2.01; fore margin irregularly arcuate, with apex blunt and obtuse; genae not aligned to fore margin, slightly produced outwards, rounded; genal canthus short, intruding the eye only for one sixth of ocular length; dorsal ocular area large (interocular distance about five times the maximum width of the dorsal ocular area), ventral ocular area about as large as dorsal ocular area. Head surface unevenly sculptured; disc with a slightly raised wide smooth tubercle, vertex with a slightly raised irregular-V-shaped smooth process; surface sculpturing with small irregular dense wrinkles. Pronotum: subtrapezoidal, relatively wide (W/L ratio = 1.54), fore angles broadly triangular, fore margin and base distinctly beaded; sides of pronotum marked by a blunt carina ending in correspondence with the humeral angle of elytra; pronotum regularly convex; the whole surface covered by dense deep short wrinkles. Scutellum: a little longer than wide; apex sharp and acute, with distal third narrow, each side slightly curved inward; sides of base notched by articular process of elytron; surface covered by deep comma-shaped punctures. Elytra: longer than wide (W/L ratio = 0.85); moderately convex, outline (dorsal view) relatively elongate-oval, surface with more than ten fine shallow longitudinal regular striae, interstriae wide and smooth with very fine sparse simple punctation and with some irregular weak carinae and/or tubercles on discal portion, apical third of interstriae with strongly raised irregular tubercles or short carinae. Epipleura marked by a strong serrated bead with serrations very widely spaced, distal and median area between longitudinal interstria and epipleuron broadly furrowed. Wings absent (apterous). Antennae short, ten-segmented, scape relatively short, strongly securiform, pedicel rounded, slightly bent forward, funicle short, segments noticeably wider than long, club as long and almost as wide as funicle, three-segmented, segments small and setose, apart from the outer face of the first segment, which is almost glabrous. Protibiae with outer side with two strong outer apical teeth plus some basal smaller denticles. Apical spur of protibiae slender, short with tip acute and slightly bent downwards. Mesotibiae relatively slender, outer side strongly serrated, bearing regularly spaced strong short setae, outer face rugose: covered by several longitudinal to slightly transverse fine lines, apical edge completely covered by a sparse short setation and bearing two sexually dimorphic apical spurs near inner apical angle. Metatibiae relatively slender, slightly triangular, ending with two short, straight apical spurs, sides bearing regularly spaced strong short setae, outer face smooth apart from some longitudinal to slightly transverse fine lines. Expanded apical truncation small. Ventral side of tarsi (with the exception of the last tarsomere) with tufts of short setae. Sexual dimorphism: males have the inner apical spur of mesotibiae distinctly bent inwards, while in the female both apical spurs are straight. Male genitalia (Figs. 16, 19): aedeagus with parameres laterally flattened, relatively short and strongly sclerotized, very slightly asymmetrical; basal piece slightly twisted and longer than parameres.

Variability. The type series is quite variable in the sculpturing of elytra, whose interstriae show a strong variability as to the number and development of tubercles. The punctation of head and pronotum is also variable with pronotal disc having sometimes sparser wrinkles.

Etymology. Noun in the genitive case. Patronymic to honor Juan Enrique Barriga (Los Niches-Curicó, Chile), who collected many specimens of this new species.

Distribution and Biology. Known only from the pre-mountainous area of the Maule Region: Potrero Grande (Curicó), Altos de Vilches (Talca) and Malcho (Parral). This species lives in forests of “coigue” *Nothofagus dombeyi* (Mirb) Oerst. and “roble” *N. obliqua* (Mirb) Oerst. (Nothofagaceae), with an undergrowth composed of herbaceous plants and medium-height shrubs typical of the Maulino forest of central-south Chile (Fig. 5). The average annual rainfall in these locations ranges from 1100 to 1800 mm, usually with an abundant snowfall from June to October. Adults of *M. barrigai* were collected during the day under dead logs of *Nothofagus* or under its bark, while at night it was possible to observe them walking actively on trunks located in the wettest sectors of the forest. An easy way to obtain adults of this species is by using unbaited pitfall traps (Barber traps) placed under the leaves accumulated on the ground next to the dead logs.

Martinezostes poqui n. sp. - Fig. 6–10, 17, 20, 21 - http://zoobank.org/44426b3d-763c-4b64-b2b1-2619e40fd952

Examined material. Type series. Holotype male in MNNC: / CHILE Cachapoal Cerro Poqui (Base ladera sur) 416 msnm 34°12’40.4”S, 71°03’21.0”O 30 agosto - 29 sept. 2016 Trampa pitfall leg. M Elgueta / Holotype male *Martinezostes poqui* n. sp. des. Ballerio & Mondaca /. Paratypes (62 specimens): 12 (ABCB): Chile - O’Higgins: Cerro Poqui, 24.VIII.2015 tramo. J. Mondaca & A. Ballerio; 2 (in etanol) (MNNC): Chile, Reg. O’Higgins, Coltauco, Cerro Poqui, 15.V.2016, col. M. Guerrero. 15 (in etanol) (11 MNNC, 4 ABCB): Chile, Reg. O’Higgins, Cerro Poqui, Doñihue, 3.IX.2015, 520 mts, 34°12.38’S, 71°03.74’W, col. T. Fichet; 2 (JMEC): Cerro Poqui (Doñihue), Región del Gral. B. O’Higgins, S34°12.38, W71°03.74, 520 m, 17.X.2015, col. Thomas Fichet; 4 (JMEC): Chile, Reg. B. O’Higgins, Cerro Poqui, 21.X.2013, col. J. Mondaca E.; 5 (JMEC): Chile, Cachapoal, Cerro Poqui, 24.VIII.2015, col. J. Mondaca E.; 1 (JMEC): Chile, O’Higgins, Cerro Poqui, 8.I.2015, col. T. Fichet; 3 (JMEC): Chile, Cachapoal, Apalta, 10.VIII.2019, col. C. Pineda; 3 (FRFC): Cerro Poqui, Coltauco, VI Reg. 500 m, 22/23.VII.2012, leg. F. Ramírez; 1 (FRFC): Rangue, Laguna de Aculeo, Santiago, 07.VII/01.VIII.2014, leg. F. Ramírez; 2 (FRFC):

Chile, Prov. Maipo, Rangue, El Cepillo, 27.VII.2010, col. J. Mondaca E.; 10 (MNNC): Chile, Cachapoal, Cuesta R.N. Loncha, 596 msnm, 34°11.148 S, 70°56.842 W, 14 agosto-29 agosto 2018, Trampa caída 1, musgo, M. Elgueta y J. Solervicens; 3 (MNNC): Chile, Cachapoal, NE de Lo Moscoso, 872 msnm, 34°34'15.1"S, 71°04'40.8"O, 21 octubre -15 nov. 2016, Trampa pitfall 2. leg. M. Elgueta; 3 (MNNC): Chile, Cachapoal, Cerro Poqui, (Base ladera sur), 476 msnm, 34°12'32.0"S, 71°03'23.3"O, 20 octubre -21 nov. 2016, Trampa pitfall, leg. M. Elgueta.

DIAGNOSIS. Within the Chilean fauna *M. poqui* can be mistaken only with *Germarostes posticus* (Fig. 22) because of the simple punctation of pronotum (all other known Chilean Ceratocanthinae have wrinkled pronotum). It differs from *G. posticus* because of the wider pronotum (W/L ratio = 1.90 vs. 1.64 in *G. posticus*), as well as because of the striae, which are continuous and not interrupted several times (as in *G. posticus*) and the sculpturing of the apical third of elytra, which in *M. poqui* bears several strong tubercles, which are less developed in *G. posticus*.

DESCRIPTION. HL 0.55 mm; HW: 1.38 mm; PL: 1.50 mm; PW: 2.06 mm; EL: 3.18 mm; EW: 2.88 mm. Medium sized flightless Ceratocanthinae. Body moderately convex, dorsum glabrous (20x), shiny, black; underside, tarsi and antennae reddish-brown, setation yellowish. Head: W/L ratio= 2.50; fore margin irregularly arcuate, with apex blunt and obtuse; genae not aligned to fore margin, slightly produced outwards, rounded; genal canthus short, intruding the eye only for one sixth of ocular length; dorsal ocular area large (interocular distance about five times the maximum width of the dorsal ocular area), ventral ocular area about as large as dorsal ocular area. Head surface unevenly sculptured; disc with a slightly raised smooth tubercle; surface sculpturing with irregular relatively dense comma-shaped punctures with curvature inwards. Pronotum: subtrapezoidal, very wide (W/L ratio = 1.90), fore angles broadly triangular, fore margin and base distinctly beaded; sides of pronotum marked by a blunt carina ending in correspondence with the humeral angle of elytra; pronotum regularly convex; the whole surface, apart from sides and base, covered by dense simple relatively shallow punctation; sides covered by sparser comma-shaped punctures mixed to few horseshoe-shaped punctures. Scutellum: a little longer than wide; apex sharp and acute, with distal third narrow, each side slightly curved inward; sides of base notched by articular process of elytron; surface with some comma-shaped punctures. Elytra: slightly longer than wide (W/L ratio = 0.93); moderately convex, outline (dorsal view) oval, surface with more than ten fine shallow longitudinal irregular striae, interstriae wide and smooth with some irregular small strong tubercles on distal third. Sides of elytra with several longitudinal small irregular carinae. Epipleura marked by a strong serrated bead with serrations very widely spaced, distal and median area between longitudinal interstria and epipleuron broadly furrowed. Wings absent (apterous). Antennae short, ten-segmented, scape relatively short, strongly securiform, pedicel rounded, slightly bent forward, funicle short, segments noticeably wider than long, club as long and almost as wide as funicle, three-segmented, segments small and setose, apart from the outer face of the first segment, which is almost glabrous. Protibiae with outer side with two strong outer apical teeth plus some basal smaller denticles. Apical spur of protibiae slender, short with tip acute and slightly bent downwards. Mesotibiae relatively slender, outer side strongly serrated, bearing regularly spaced strong short setae, outer face rugose: covered by several longitudinal to slightly transverse fine lines, apical edge completely covered by a sparse short setation and bearing two sexually dimorphic apical spurs near inner apical angle. Metatibiae relatively slender, slightly triangular, ending with two short straight apical spurs, sides bearing regularly spaced strong short setae, outer face smooth apart from some longitudinal to slightly transverse fine lines. Expanded apical truncation small. Ventral side of tarsi (with the exception of the last tarsomere) with tufts of short setae. Sexual dimorphism: males have the inner apical spur of mesotibiae distinctly bent inwards, while in the female both apical spurs are straight. Male genitalia (Figs. 17, 20): aedeagus with parameres laterally flattened, relatively short and strongly sclerotized, very slightly asymmetrical; basal piece slightly twisted and longer than parameres.

VARIABILITY. The type series is quite variable in the size, since the total length ranges from 5 to 7 mm and this is relatively unusual for Ceratocanthinae, where the variation in length is normally feeble. The sculpturing of apical third of elytra is also variable in the shape and number of tubercles.

ETYMOLOGY. Noun in apposition. The name refers to the type locality.

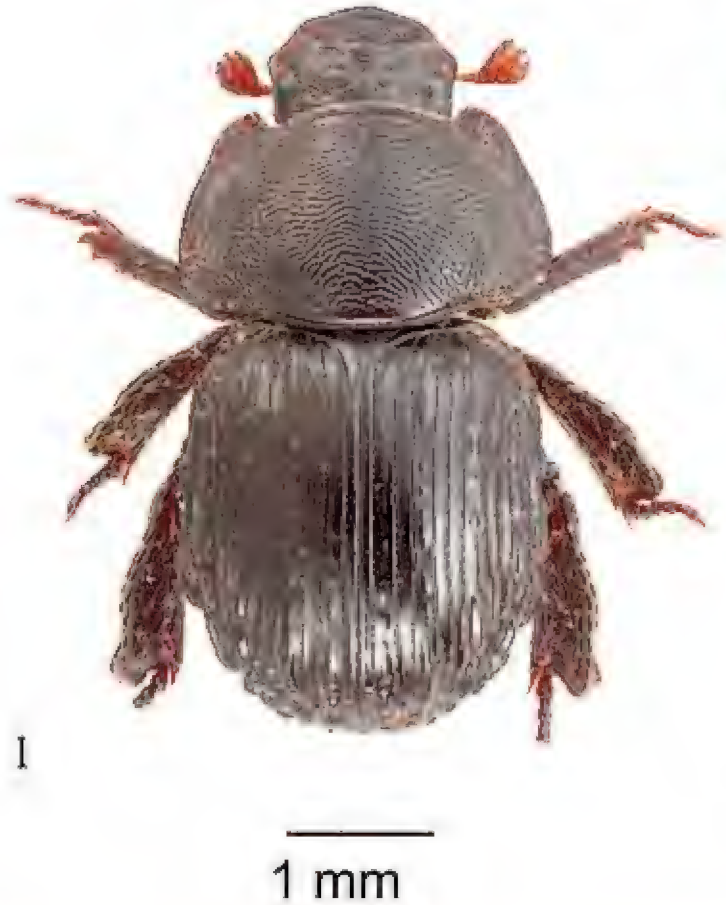
DISTRIBUTION AND HABITAT. Known only from localities in the coastal mountain range of the Santiago Metropolitan region and O'Higgins region. *Martinezostes poqui* n. sp. lives in forests of "hualo" *Nothofagus glauca* (Phil.) Krasser and "roble de Santiago" *N. macrocarpa* (A.DC.) F. M.Vázquez & R.A. Rodr. (Nothofagaceae), mixed with a sclerophyll vegetation typical of the Maulino forest of central Chile (Fig. 10). The average annual rainfall is 663 mm, concentrated from June to August. The Cerro Poqui sector is included in the priority conservation site called "La Roblería / Cordillera de la Costa Norte y Cocalán". For collecting circumstances see under *M. barrigai* n. sp.

Martinezostes ruizi (Gutiérrez, 1946) - Fig. 11–15, 18, 21)

EXAMINED MATERIAL. Holotype male in MNNC: / Holotypo / Curicó IV-1939 N.N. Coll. / Chile / Sud - America / *Cloeotus ruizi* Gutierr. R. Gutiérrez det. 47 /; Paratype (MZUC): Curicó IV.1939 N.N. Coll.; Non typical material: 1 male (JEBC): Chile, Prov. Curicó, Romeral-Los Queñes, I.1981, leg. J. E. Barriga; 1 (JEBC): Chile, Prov. Curicó, Romeral Los Queñes, ene. 1981, leg. J.E. Barriga; 1 (JMEC): Chile, Prov. Maipo, Rangue-El Cepillo, 27.VII.2010, col. J. Mondaca E.; 2 (JMEC): Chile, B. O'Higgins, Cerro Poqui, 21.X.2013, col. J. Mondaca E.; 1 (JMEC): Chile, Colchagua, Alto Huemul, 21.XI.2001, J. Mondaca E.; 1 (JMEC): Alto Huemul, San Fernando, VI reg., 22.IV.2000, col. M. Gálvez A.; 1 (JMEC): Chile, Prov. Cachapoal, Cerro Poqui, 5.X.2013, leg. Carlos Vidal; 3 (ABCB): Chile, Reg. O'Higgins, Cerro Poqui, Doñihue, 3.IX.2015, 520 mts, 34°12.38'S, 71°03.74'W; 1 (JMEC): Chile, Cachapoal, Cerro Poqui, 3.IX.2015, col. Th. Fichet; 2 (MNNC): Chile, Cachapoal, Cerro Poqui (Base ladera sur), 476 msnm, 34°12'32.0"S, 71°03'33.3"O, 30 agosto - 29 sept. 2016, Trampa pitfall, leg. M. Elgueta; 1 (MNNC): Chile, Colchagua, E Lo Moscoso, 465 msnm, 33°26.146'S, 70°50.789'W, 25 septiembre-18 octubre 2018, trampa caída, musgo, M. Elgueta y J. Solervicens; 1 (MNNC): Chile, Colchagua, E Lo Moscoso, 872 msnm, 33°34'15.1"S, 71°04'40.8"W, 21 octubre-15 noviembre 2016, trampa pitfall, leg. M. Elgueta.

DISTRIBUTION AND HABITAT. Known from various localities in the coastal mountain range and in the Andes mountain range of Central Chile: Rangue - El Cepillo and Laguna de Aculeo (Región Metropolitana de Santiago), Cerro Poqui, Lo Moscoso, and Alto Huemul (Región de O'Higgins), Curicó and Romeral - Los Queñes (Región del Maule). *Martinezostes ruizi* lives in forests of "coigüe" *Nothofagus dombeyi* (Mirb.) Oerst., "roble" *N. obliqua* (Mirb.) Oerst. (in Maule mountain range), "hualo" *N. glauca* Phil. Krasser and "roble de Santiago" *N. macrocarpa* (in coastal mountain range), mixed with sclerophyll vegetation characteristic of central-southern Chile. The average annual rainfall in these places increases from north to south, from 431 mm (Laguna de Aculeo) to 1194 mm (Los Queñes), the latter area experiences abundant snowfall from June to October. For collecting circumstances see under *M. barrigai* n. sp.

REMARKS. *Martinezostes ruizi* has been misinterpreted till now probably due to the circumstance that Paulian (1982), while revising the South American fauna of Ceratocanthinae, did not examine the type material of this species. As a result both the specimens attributed to *M. ruizi* and illustrated respectively by Paulian (1982: plate X fig. a) and by Howden & Gill (2000: fig. 28) do not match the holotype of *M. ruizi* (and the description by Gutiérrez) and are representatives of other species falling within the *asper/fortecostatus* group of species, i.e. the *Martinezostes* species having the elytral interstriae divided into many pseudostriae. Conversely the true *M. ruizi* has wide smooth interstriae and is closely related to *M. barrigai* n. sp. from which it differs because of the characters listed in the diagnosis of the new species. Gutiérrez's collection is kept in MZUC and MNNC. In Gutiérrez collection several type locality labels do not exactly match the collecting records that Gutiérrez published in his papers. One such example is *M. ruizi*: Gutiérrez in the 1946 paper lists only one specimen ("Tipo") coming from "Curicó. Zona maritima" "I–35". In MNNC we found the



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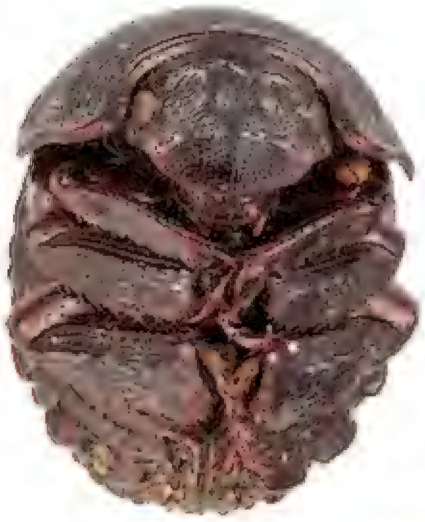

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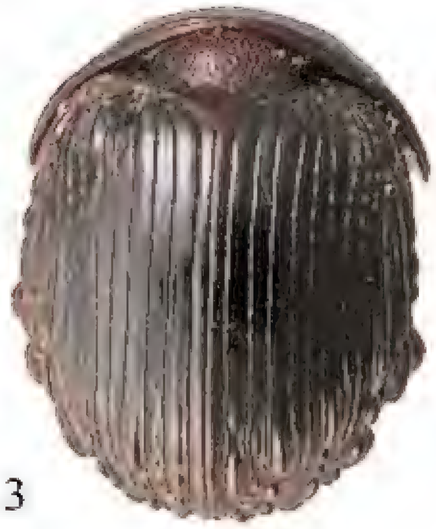

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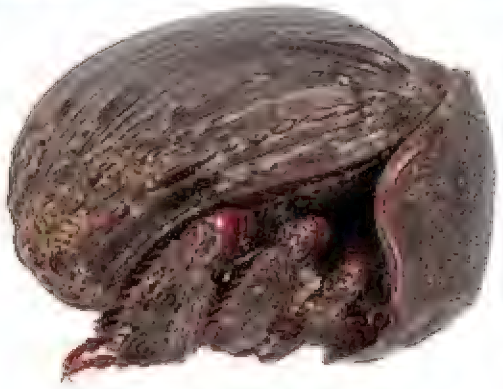

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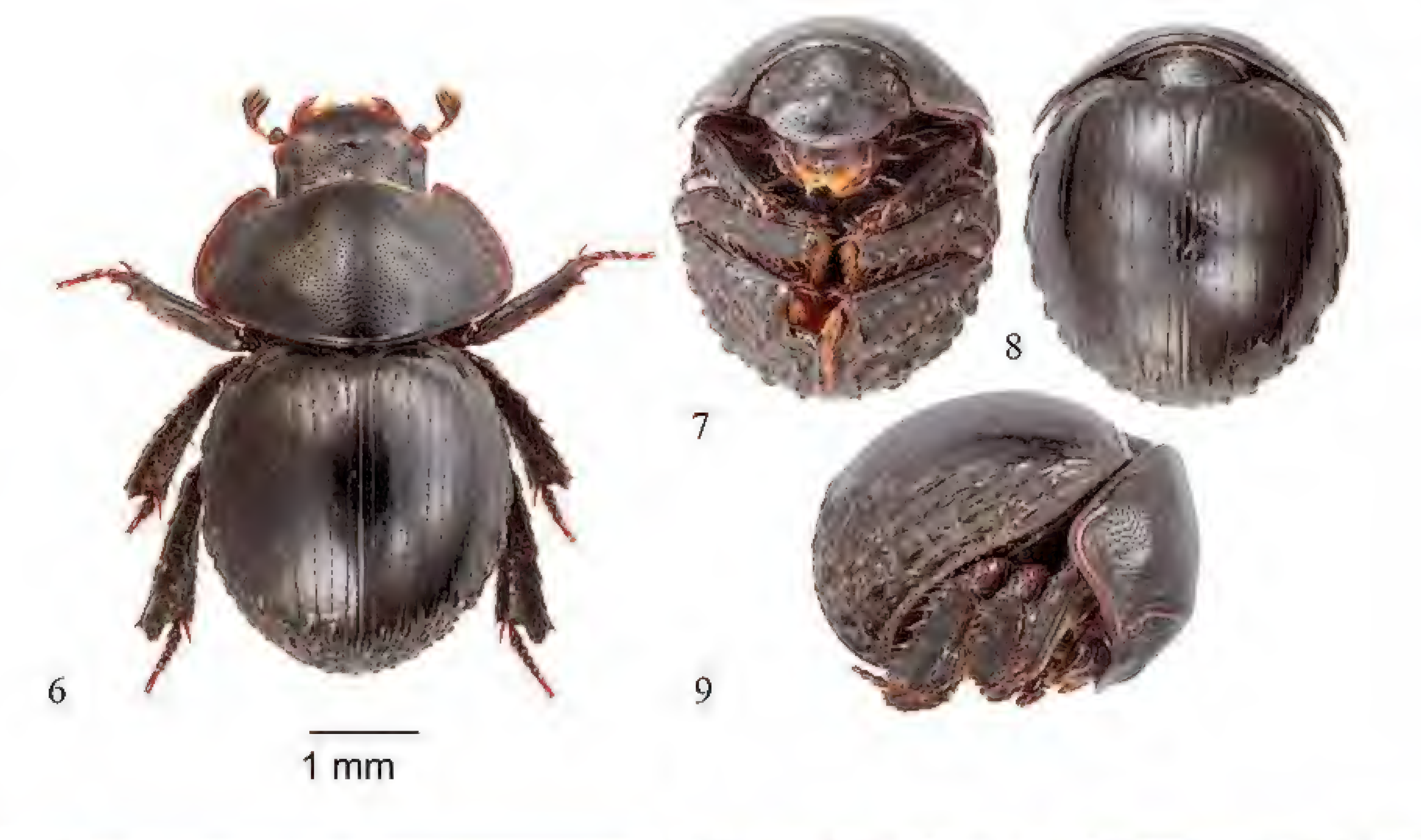
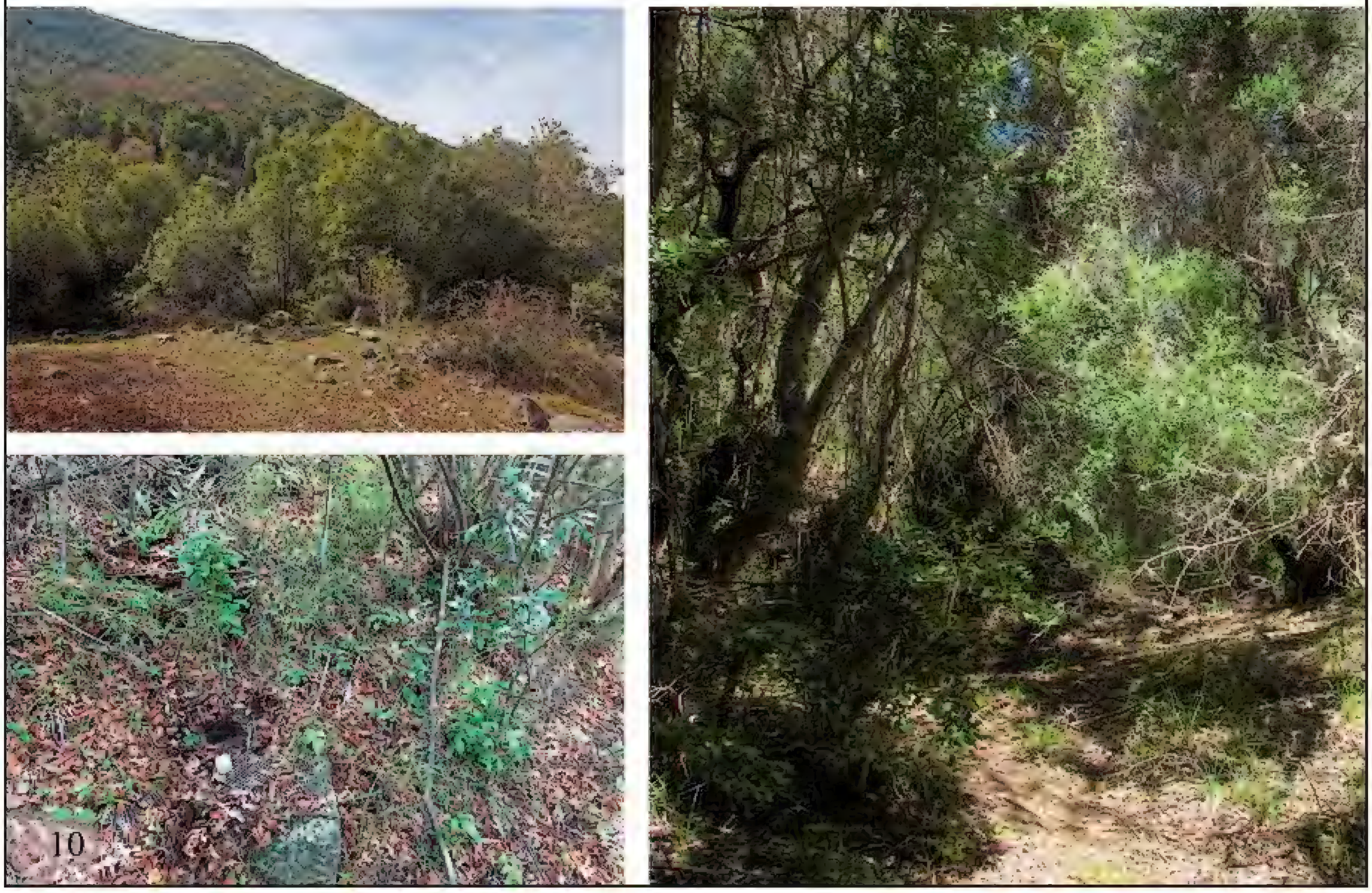
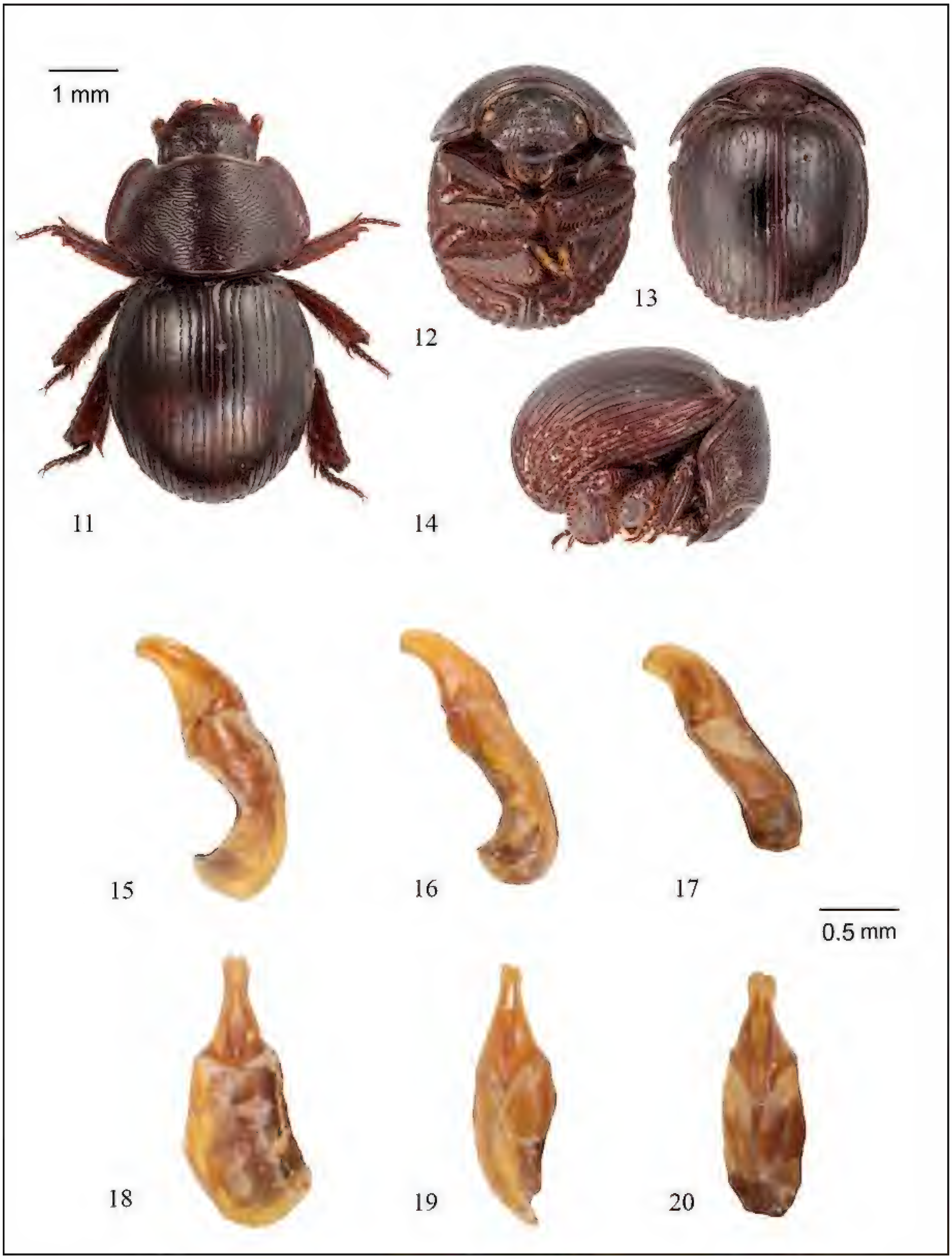
Figures 1–4. *Martinezostes barrigai* n. sp. Fig. 1: distended paratypus (Malcho - Parral), dorsal view. Fig. 2: rolled up paratypus (Altos de Vilches), ventral view. Fig. 3: rolled up paratypus ((Altos de Vilches), dorsal view. Fig. 4: rolled up paratypus (Altos de Vilches), lateral view. Figure 5. *Martinezostes barrigai* n. sp.: photos of type locality (top left: Altos de Vilches, *Nothofagus* forest, bottom left: Pantano de Vilches, *Nothofagus* forest understorey, right: Altos de Vilches, *Nothofagus* forest).





Figures 6–9. *Martinezostes poqui* n. sp. (Cerro Poqui). Fig. 6: distended paratypus, dorsal view. Fig. 7: rolled up paratypus, ventral view. Fig. 8: rolled up paratypus, dorsal view. Fig. 9: rolled up paratypus, lateral view. Figure 10. *Martinezostes poqui* n. sp.: photos of type locality (top left: Cerro Poqui, bottom left: pitfall trap in Cerro Poqui, right: Cerro Poqui).



Figures 11–14. *Martinezostes ruizi* (Gutiérrez, 1946) (Cerro Poqui). Fig. 11: distended specimen, dorsal view. Fig. 12: rolled up specimen, ventral view. Fig. 13: rolled up specimen, dorsal view. Fig. 14: rolled up specimen, lateral view. Figures 15–20. Aedeagi in lateral and dorsal view. Figs. 15, 18: *M. ruizi* (Gutiérrez, 1946). Figs. 16, 19: Romeral Los Queñes, *M. barrigai* n. sp. (Altos de Vilches). Figs. 17, 20: *M. poqui* n. sp. (Cerro Poqui).

holotype, i.e., a specimen bearing the label "HOLOTIPO" (see Material examined above) although the date does not match the date indicated by Gutiérrez in the original description but we deem that this is due to a mistake made during the labeling of type material. Although Gutiérrez in the original description of *M. ruizi* mentioned only the holotype, later he gave evidence of having examined two specimens, bearing the same locality and date label (Gutiérrez, 1949). Actually we found the above mentioned paratype in MZUC. Therefore, under art. 72.4.1.1 of the Code, we can conclude that the type series of *M. ruizi* is composed of the holotype in MNNC and one paratype in MZUC, as listed under material examined above. It must be finally noticed that Cekalovic & Artigas (1969), while listing the types in MZUC made probably a mistake by inverting the records, since they listed a paratype from Valdivia under *M. ruizi* (sub *Cloeotus ruizi*) and a paratype from Curicó under *M. fortecostatus* (sub *Cloeotus fortecostatus* whose type comes from Valdivia).

Key for the identification of the new species here described within Chilean fauna

1. Pronotal sculpturing made of simple punctation...2
- Pronotal sculpturing made of transverse irregular wrinkles...3

2. Elytral striae shallow and continuous. Pronotum wide (W/L ratio = 1.90), distal third of elytra with sparse distinctly raised tubercles............................ ....*M. poqui* n. sp. (Fig. 3)
- Elytral striae deep and regularly interrupted (consisting of rows of elongate punctures especially on proximal third). Pronotum narrower (W/L ratio = 1.65), distal third of elytra with interstriae more raised than on elytral medial and proximal third, sometimes giving rise to some weak tubercles........ ....*G. posticus* (Germar, 1843) (Fig. 22)

3. Elytral interstriae divided into many pseudostriae................*asper*/*fortecostatus* group of species
- Elytral interstriae smooth (only some sparse simple fine punctation visible)...................................4

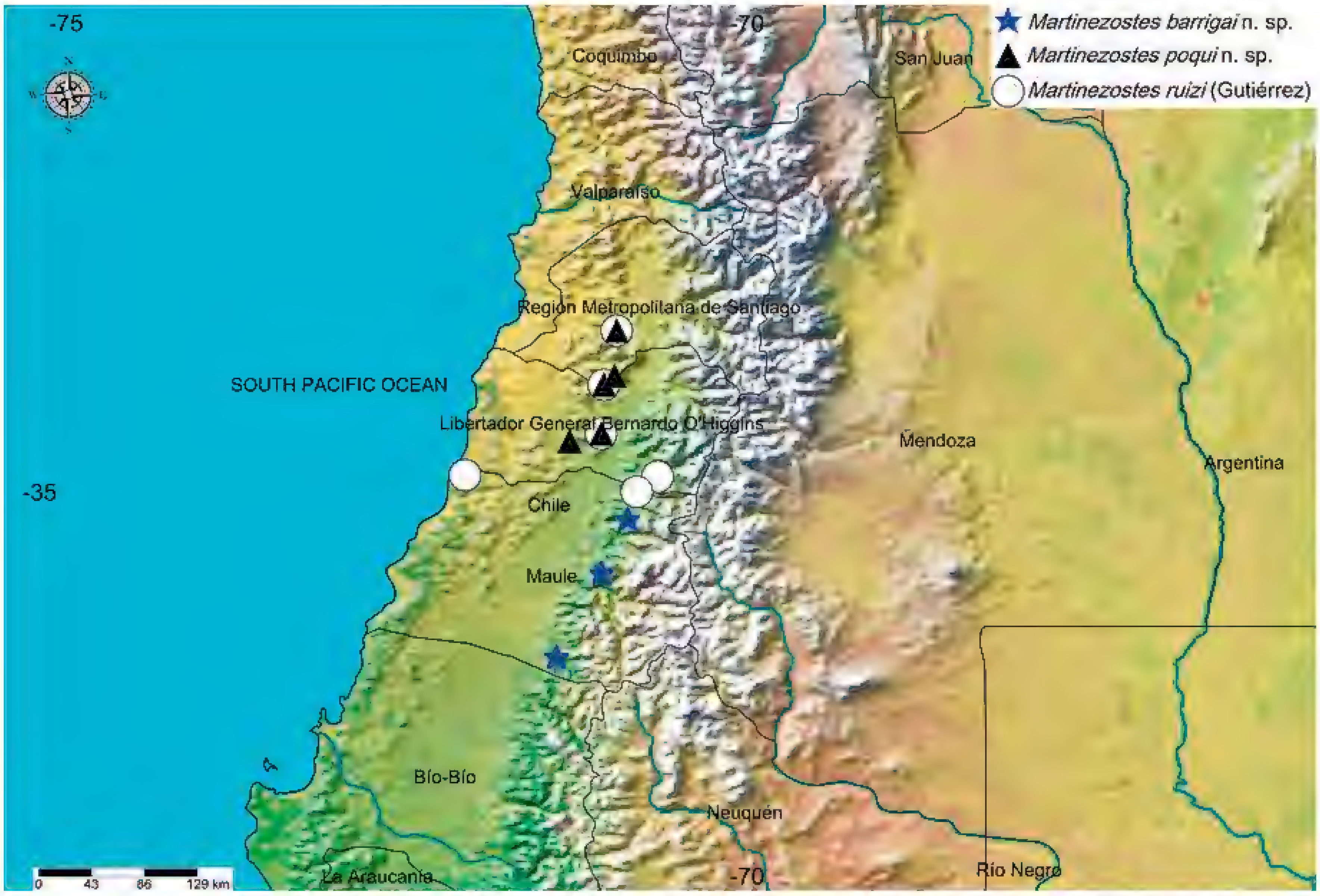

★ *Martinezostes barrigai* n. sp.
▲ *Martinezostes poqui* n. sp.
○ *Martinezostes ruizi* (Gutiérrez)
-75
-70
-35
-70
Coquimbo
San Juan
Valparaíso
Región Metropolitana de Santiago
SOUTH PACIFIC OCEAN
Libertador General Bernardo O'Higgins
Mendoza
Argentina
Chile
Maule
Bío-Bío
Neuquén
La Araucanía
Río Negro
0 43 86 129 km

Figure 21. Distribution map: *Martinezostes ruizi* (Gutiérrez, 1946) (white circles), *M. barrigai* n. sp. (blue stars) and *M. poqui* n. sp. (black triangles).

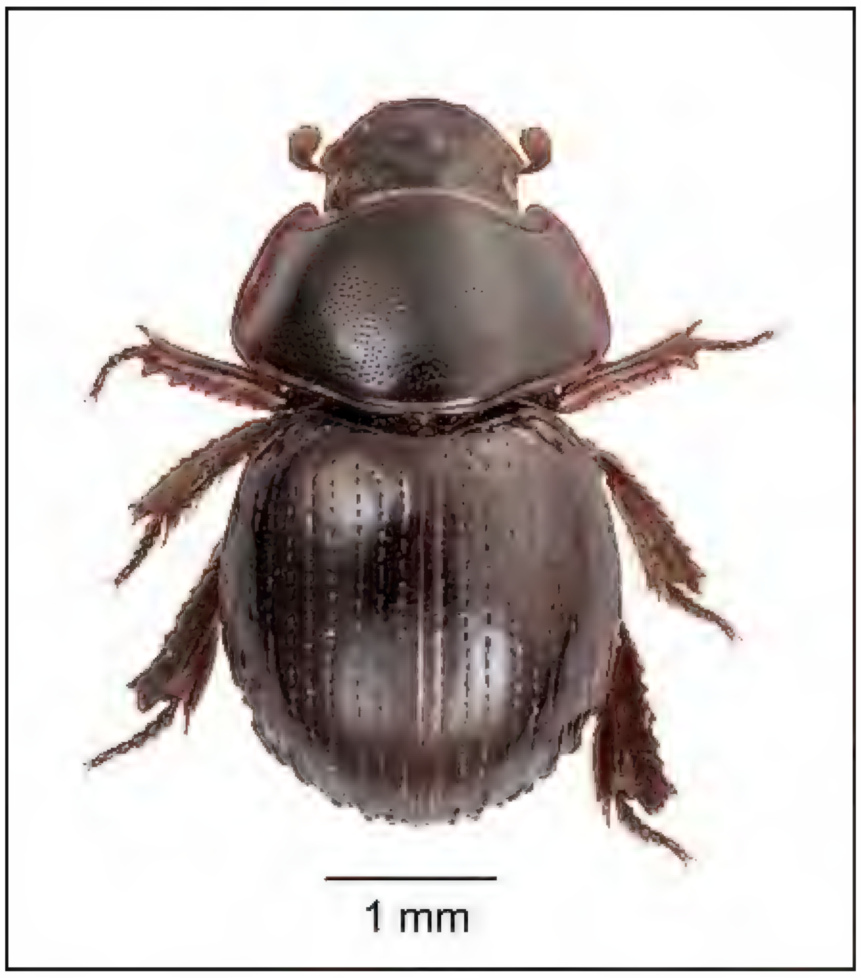


Figure 22. *Germarostes posticus* (Germar, 1843): distended specimen from La Campana National Park (Valparaíso).

4. Elytral striae straight, elytral interstriae with few sparse irregular weak tubercles on proximal and median third, distal elytral tubercles larger and strongly raised.................*M. barrigai* n. sp. (Fig. 1)
- Elytral striae irregularly longitudinal, elytral interstriae smooth on proximal and median third, distal elytral tubercles smaller and less strongly raised ....*M. ruizi* (Gutiérrez, 1946) (Fig. 5)

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The genus *Mauritanica* O. Boettger, 1879 (Gastropoda Stylommatophora Clausiliidae) in Tunisia

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ABSTRACT Currently, the genus *Mauritanica* O. Boettger, 1879 (Gastropoda Stylommatophora Clausiliidae) is widespread in north-eastern Algeria and central-northern Tunisia with six taxa. The taxonomic position of this genus has often been interpreted differently and the relationship with other similar genera, in particular with *Siciliaria* Vest, 1867, still remains to be clarified. In this paper, we provide a further contribution to the knowledge of *Mauritanica* by analyzing morphologically (shell, genitalia, and the type museum material) all the known Tunisian populations. In particular, the geographical spread and taxonomy of *M. tristrami* s.l. (L. Pfeiffer, 1861), *M. philora* s.l. (Letourneux, 1887), *M. perinni polygyra* (O. Boettger, 1879), and *M. cossoni* (Letourneux, 1887) are redefined. *Mauritanica perinni zaghouanica* (Letourneux, 1887) could be a valid taxon. *M. tristrami zribensis* n. ssp., *M. tristrami nouirasaidi* n. ssp. and *M. philora bognanii* n. ssp. are described.

KEY WORDS Door snails; Nord-Africa; taxonomy; new taxa; biodiversity.

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INTRODUCTION

The genus *Mauritanica* O. Boettger, 1879 (Gastropoda Stylommatophora Clausiliidae) is widespread in north-eastern Algeria and central-northern Tunisia with six taxa: *M. tristrami tristrami* (L. Pfeiffer, 1861), *M. tristrami philora* (Letourneux, 1887), *M. numidica* (Letourneux, 1870), *M. perinni perinni* (Bourguignat, 1876), *M. perinni polygyra* (O. Boettger, 1879), and *M. cossoni* (Letourneux, 1887).

Mauritanica was almost always considered a subgenus of *Delima* Hartmann, 1842 (Wagner, 1919; Kennard & Woodward, 1923; Lindholm, 1924) or *Charpenteria* Stabile, 1864 (Nordsieck, 2002, 2007; Bank & Neubert, 2019 with notes).

Schileyko (2000) provides a detailed description of *Mauritanica*, however not corresponding to morphology of all known populations of this genus, Tunisian in particular: "*Shell slender, fusiform, rather thin, of 13–15 nearly flat whorls. Basal keel weak, rounded. Color reddish, chestnut or corneous-bluish; ribs white. Postembryonic whorls finely, accurately ribbed. Aperture rounded-subquadrangular, with a little reflexed, somewhat thickened margins. Superior lamella short, its inner end located deeper than external end of spiral lamella. Inferior lamella not strong, deeply lying. Subcolumellar lamella absent. Principal plica starting on right side. Lunella rightdorsal, broad, callouse. Upper palatal plica rudimentary or wanting. Height 18–26, diam. 4.0–5.5 mm (20.1 x 4.3 mm)*".

Nordsieck (2002), considering *Mauritanica* subgenus of *Charpenteria*, speculates that *Mauritanica* species and *C. paestana* may belong to a monophiletic group. *Charpenteria* and *Mauritanica* would be similar for the reduction of the anterior palatal plicae and for the penial pseudopapilla relatevely long. In the same work, Nordsieck (2002) classified the species of this subgenus into two groups: *numidica* group (shell with sutural papillae) and *tristrami* group (shell with withe surface layer).

Subsequently, Nordsieck (2013a, b) proposed *Mauritanica* as a subgenus of *Siciliaria* Vest, 1867 based on preliminary molecular data (Scheel & Hausdorf, 2012; Uit de Weerd & Gittenberger, 2013) and on some common morphological characters such as the presence, in the genital organs, of a thickening in the passage from the penis to the epiphallus (missing in *Charpentieria*) and for an indistinct delimitation between proximal and distal penis (distinct in *Charpentieria*).

From what has been summarized above, the taxonomic position of *Mauritanica* remains questionable, also because most of these taxa are not well known. Only *M. tristrami* has recently been redescribed (Sparacio et al., 2019).

In this work, we will provide a further contribution to the knowledge of *Mauritanica* analyzing morphologically (shell and genitalia) all the known Tunisian populations.

MATERIAL AND METHODS

Numerous localities in Tunisia have been sampled. They are mentioned, described, illustrated and summarized in a map, below. Empty shells and live specimens were collected in the field on sight on the soil and under the rocks. Observations on ecology of these organisms were made directly in the field. The shells have been immersed for less than two minutes in a solution with 60% of water (H2O) and 40% of NaClO, and sub-sequently cleaned with water and a flattipped and hard bristles paintbrush. Dry shells have been studied regarding size, colour, morphology, sculpture, aperture, plicae and lamellae, lunella and clausilium. In order to study and illustrate genital organs, some specimens were put in water and fixed in 80% ethanol. The bodies were isolated from the shells and dissected under the Optika stereomicroscope using a very fine pointed scalpel, scissors and needles. Photos were taken with a Canon EOS 100D camera. Height and maximum diameter of the shell along with some parts of genitalia were measured (in millimeters) by a digital gauge.

Taxonomical references are based on the checklist of the land and freshwater Gastropoda of Europe (Bank, 2017; Bank & Neubert, 2019).

In the shell description, apertural elements are defined: plicae or lamellae if they consist of elongated spiral structures situated in the palatum or parietum and columella respectively. The part of the cervix beside the basal keel is called cervical swelling or, if more distinct, dorsal keel. For the lower palatal plica (basalis plica) the following terms are used: posterior part = subclaustralis, anterior part = basalis. In the anatomical description, proximal denotes the part which is closer to the gonad and distal the part which is closer to the gonopore. The proximal female genitalia, sometimes indicated in the tables, are not described because they are not informative.

The materials used for this study are deposited in the following Museums and private collections: Faculté des Sciences, Université de Tunis, Tunisia (SUT); F. Liberto collection, Cefalù, Italy (CL); Museo Civico di Storia Naturale di Genova "G. Doria", Italy (MSNG); Museo Civico di Zoologia, Rome, Italy (MCZR); Muséum d'Histoire Naturelle de Genève, Switzerland (MHNG); Natural History Museum University of Florence Zoological Section "La Specola", Florence, Italy (MZUF); I. Sparacio collection, Palermo, Italy (CS).

ABBREVIATIONS AND ACRONYMS. A: atrium; AG: albumen gland; BC: bursa copulatrix; BCD: duct of bursa copulatrix; BP: basalis plica (=lower palatal plica); BCM: branch of the columellar muscle; CD: copulatory duct; CL: columellar lamella; DBC: diverticulum of bursa copulatrix; E: epiphallus; FO: free oviduct; G: penial pseudopapilla; L: lunella; LO: left ommatophore; P: penis; PL: parietal lamella; PP: principal plica; PR: penial retractor muscle; PUPP: posterior upper palatal plica; SCL: subcolumellar lamella; SCP: subclaustralis; SL: spiral lamella; SP: sutural plica; UOS: uterine ovispermiduct; V: vagina; VD: vas deferens.

D: shell maximum diameter; ex/x: specimen/s; H: shell height; leg.: legit; m: meter/s; mm: millimeter/s; R2: ribs number on 2 mm of the penultimate whorl; sh: shell/s; s.l.: sensu lato; s. str.: sensu stricto.

RESULTS

Systematics

Phylum MOLLUSCA Cuvier, 1795
Classis GASTROPODA Cuvier, 1795
Ordo STYLOMMATOPHORA A. Schmidt, 1855
Superfamilia CLAUSILIOIDEA Gray, 1855
Familia CLAUSILIIDAE Gray, 1855
Subfamilia ALOPIINAE A.J. Wagner, 1913
Tribù DELIMINI R. Brandt, 1956
Genus *Mauritanica* O. Boettger, 1879

Type species: *Clausilia tristrami* L. Pfeiffer, 1861

Mauritanica tristrami tristrami (L. Pfeiffer, 1861) - Figs. 1–18, 82

Clausilia tristrami - L. Pfeiffer, 1861: 140 - locus typicus: "Interior of Tunis"
Clausilia tristrami - Küster in Martini & Chemnitz, 1861: 307, tav. 35, figs. 1–3 - im Inner von Tunis
Clausilia tristami - Bourguignat, 1864: 71–73, tav. 5, figs. 4–6 - versant méridional de l'Atlas, dans l'interieur de la régence de Tunis
Clausilia tristami - Bourguignat, 1868: 29–30 - alentours de Tunis
Clausilia tristrami - Westerlund, 1878: 169–170 - Mons Atlas, Tunis
Mauritanica tristrami - Boettger in Kobelt, 1879: 153, tav. 178, fig. 1800 - Atlas in Tunisien
Clausilia belluccii - Issel, 1880: 278–279 - Monte Resas (Fig. 2)
Clauslia tristami - Hagenmuller, 1884: 211 - Tunisie
Clausilia tristrami - Westerlund, 1884: 73 - Tunis
Clausilia bonneti - Letourneux in Letourneux & Bourguignat, 1887: 111 - Djebel Bou-Kourneïn
Clausilia tristami - Letourneux & Bourguignat, 1887: 111–112 - Djebel Resas, Djebel Bou-Kourneïn
Clausilia belluccii - Letourneux & Bourguignat, 1887: 112 - Djebel Resas, Zaghouan, Hammam Zeriba dans l'Enfida, Djebel Bou-Kourneïn, Oued-el-Hammam près Tunis
Clausilia philora - Letourneux in Letourneux & Bourguignat, 1887: 112–113
Clausilia (*Mauritanica*) *tristrami* - Westerlund, 1890: 116 - Tunesien
Clausilia tristrami - Westerlund, 1901: 71 - Tunesia
Delima (*Mauritanica*) *tristrami* - Wagner, 1919: 132 - Tunis
Delima (*Lampedusa*) *tristrami* - Kennard & Woodward, 1923: 307
Delima (*Lampedusa*) *tristrami* - Lindholm, 1924: 58
Papellifera bidens [not Linné 1758] - Ktari & Rezig, 1976: tav. 8, figs. 3–4 - Zaghouan
Mauritanica tristrami - Nordsieck, 1979: 260
Mauritanica tristrami - Schileyko, 2000: 668, fig. 878
Charpenteria (*Mauritanica*) *tristrami* - Nordsieck, 2001: 20
Charpenteria (*Mauritanica*) *tristrami tristrami* - Nordsieck, 2002: 27, 29, 30 35, 36, fig. 3.
Charpenteria (*Mauritanica*) *tristrami tristrami* - Nordsieck, 2007: 54
Charpenteria (*Mauritanica*) *tristrami tristrami* - Abbès, 2012: 46, pl. 4 fig. B.
Mauritanica tristrami tristrami - Sparacio et al., 2019: 52-57, figs. 1–3 - Djebel Reças, Djebel Bou Kornine, Djebel Zaghouan

EXAMINED MATERIAL. Tunisia, Hamman el Lif., Kobelt, ex coll. Monterosato, 1 ex (MCZR-M-6181) (Fig. 1). Tunisie, Nabeul, Djebel-Bou-Kournine (= Jabal Bu Qarnayn), près de Hammam Lif - collection Bourguignat G 16 - *Clausilia bonneti* Letourneux in Letourneux & Bourguignat, 1887, syntype, MHNG-MOLL-108060 (Fig. 3). Tunisia, Djebel Boukornine, 8.IV.2014, 1 ex, leg. I. Sparacio (CS 4009/1); Djebel Zaghouan, 14.V.1987, 2 exx, leg. I. Sparacio (CS 3158/2); idem, 8.IV.2014, 6 exx, leg. I. Sparacio (CS 4010/6) (Figs. 4–14, 18); Djebel Reças, Mornag, 36°36'57.3"N 10°20'12.4"E, 17.III.2018, 46 exx, leg. I. Sparacio (CS 4446/46); idem, 6 exx (CL T401–T406) (Fig. 4); Jebel Ressas, in hole on limestone wall, ante 2014, ex coll. M. Calò, 1 ex (CL T422).

DESCRIPTION. Shell sinistral, fusiform elongated, with 15–16.5 slightly convex whorls, reddish or reddish-gray with white ribs; apical whorls almost cylindrical, consisting of two smooth and rounded embryonal whols, the 3–5 postembryonal whorls with sparse and scarcely high ribs; subsequent whorls almost flat, with more robust and close ribs, slightly oblique, R2: 7–9; H: 22–26 mm (mean 24 mm), D: 4.0–4.6 mm (mean 4.3 mm); suture moderately deep; closed umbilicus; basal keel distinct, cervical swelling weak; subsquared-rounded aperture, reflex peristome, fused above on the last whorl.

On palatum (Figs. 6, 8) there are: a thin sutural plica, the principal plica well developed, which protrudes slightly beyond the lunella, upper palatal plica developed only in the posterior portion, lunella distinct, in dorsolateral position, rudimentary subclaustralis plica merged with the base of the lunella.

On parietum (Figs. 7, 9), starting from the suture, there are: a raised parietal lamella that reaches or slightly surpasses the spiral lamella, the latter is marked and progressively decreases in height towards the aperture, columellar lamella high within, subcolumellar lamella visible in frontal view, not reaching the internal peristome border.

Clausilium (Fig. 10) plough-like with sub-rectangular basal plate, slightly emarginated, roudend sutural angle and straight columellar edge.

Genitalia (Figs. 11–14). Distal genitalia consist of vagina (1.8–2 mm) uniform in diameter throughout its length, bursa copulatrix complex consist of robust copulatory duct, slightly longer than the vagina (2.8 mm), branched in a diverticulum of the bursa copulatrix (4 mm), and a shorter and cylindrical bursa copulatrix duct, the separation between bursa copulatrix and its duct is hardly recognizable (bursa copulatrix duct+bursa copulatrix 3 mm); short and robust free oviduct; vas deferent long and slender, entering the apical portion of epiphallus; epiphallus (3 mm) divided by point of insertion of robust penial retractor muscle into fusiform proximal portion, and conic distal portion with thickening at the transition epiphallus-penis. Penis (1.8 mm) slightly wider than epiphallus and gradually narrows towards the genital atrium. Penial pseudopapilla well developed and rounded at the apex. Inner wall of the vagina with thin longitudinal pleats.

Body. Animal slim, elongated, posteriorly pointed, black in color, with short tentacles (Fig. 18).

DISTRIBUTION AND BIOLOGY. North-eastern Tunisia, in the limestone mountain ranges south of Tunis: Djebel Reças (Figs. 15–17), Djebel Bou Kornine, Djebel Zaghouan.

It lives on rocks and limestone walls, under stones and in the soil at the base of them.

REMARKS. *Mauritanica tristrami* was described by Pfeiffer (1861) from "*Southern slope of the Atlas, interior of Tunis*".

Bourguignat (1864) hypothesizes the presence of this species in Algeria ("*province de Constantine, vers les frontières tunisiennes*") but, currently, there is no reliable data on the presence of *M. tristrami* in Algeria.

"*Clausilia*" *bellucci* (locus typicus, Issel, 1880: "*Monte Resas; non comune, nel terriccio a piedi delle rocce, sopra la miniera di galena*") and "*Clausilia*" *bonneti* (locus typicus, Letourneux & Bourguignat, 1887: "*Djebel Bou-Kourneïn*") are synonyms of *M. tristrami tristrami*.

The examined population of *M. tristrami tristrami* from Djebel Reças, Djebel Bou Kornine, and Djebel Zaghouan do not show substantial morphological and anatomical differences between them.

Mauritanica tristrami zribensis n. ssp. - Figs. 19–25, 33, 34, 82 - http://zoobank.org/f6065e23-977b-4925-9a18-b0e94fdb349d

Clausilia belluccii - Letourneux & Bourguignat, 1887: 112 - Djebel Resas, Zaghouan, Hammam Zeriba dans l'Enfida, Djebel Bou-Kourneïn, Oued-el-Hammam près Tunis [partim, not Issel, 1880]

EXAMINED MATERIAL. Tunisia, Hammam Zriba surrondings, 7.V.1992, 1 paratype, leg. I. Sparacio (CS 3275/1) (Fig. 20); Hammam Zriba, 36°20'27.5"N 10°12'00.2"E, 27.IX.2019, 30 exx, leg. I. Sparacio (CS 5069/32) (Figs. 21–25, 34); idem, holotype (Fig. 19) (MSNG); idem 1 paratype (MHNG); idem, 1 paratype (MCZR-M-TYPE 00252); idem, 4 paratypes (CL T425–T428).

DESCRIPTION OF THE HOLOTYPE. Shell sinistral, elongated, with 16 ½ whorls; H: 26 mm, D: 4.4 mm (Fig. 19); the apical and subapical whorls are convex with very minute and just raised ribs; the following 5 whorls are yellowish in colour, the following ones are brownish-gray in colour with white ribs; R2: 8; except the apical whorls the following ones are flat, the last three subparalles to the sides, sutures indistict; basal and dorsal keels distinct, separated by an evident furrow; last whorl concave in the cervical area; aperture short, about 1/6 of shell height.

On palatum there are: a sutural plica, a raised principal plica protruding beyond the lunella, upper palatal plica developed only in the posterior portion, lunella lateral, weak, broadened below = rudimentary subclaustralis.

On parietum, starting from the suture, there are: a parietal lamella that surpasses spiral lamella, the latter is well marked and gradually decreases in height towards the aperture, columellar lamella marked and just reaching the columellar edge, subcolumellar lamella not reaching the internal border of peristome, visible in front view.

Clausilium plough-like with sub-rectangular basal plate, sutural angle slightly bent up, convex palatal edge, straight columellar edge.

Genitalia. Distal genitalia similar to that of nominotypical subspecies, distinguished by slightly longer penis (3.1 mm) and vagina (2.6 mm) shorter copulatory duct (1.8 mm) and slightly longer diverticulum of the bursa copulatrix (6 mm), and bursa copulatrix duct + bursa copulatrix (4 mm).

Body. Animal as in *M. tristrami tristami*, black-brown in colour with a paler band on the back; skin tubercle oval-elongated; upper tentacles rather short, cylindro-conical, with small black eyes; foot with sole paler than body (Fig. 34).

VARIABILITY. Shell elongated to very elongated; the whorls 15–16 subparalles to paralles to the sides. Shell usually not decollated with 16–17 whorls; the last whorl more or less concave in the cervical area; H: 24.5–26.5 mm; D: 4–4.4 mm; R2: 7–12; genitalia as in the holotype (Figs. 19–25).

ETYMOLOGY. The specific epithet refers to the type locality, Hamman Zriba (Tunisia).

DISTRIBUTION AND BIOLOGY. *Mauritanica tristrami zribensis* n. ssp. is known only for the small limestone gorge next to the village of Zriba and the surroundings of the old mines (Fig. 33).

Hamman Zriba is one of the fault blocks of the Tunisian Jurassic range as Djebel Bou Kournine, Djebel Ressas, and Djebel Zaghouan (Tawadros, 2011).

REMARKS. Letourneux & Bourguignat (1887) cited this population as "*Clausilia belluccii*" and they considered it "*variété*" of *M. tristrami*.

This new subspecies differs from *M. tristrami tristrami* for the shell less robust, more elongated with mean H/D = 6.3 (5.4 in *M. tristrami tristrami*); greater number of whorls; central whorls flatter, with thinner and more numerous ribs; last whorl concave in lateral view; aperture shorter with mean H = 4.6 (5.02 in *M. tristrami tristrami*) and mean H shell/H aperture = 5.76 (4.71 in *M. tristrami tristrami*); longer basal keel and distinct dorsal keel. On palatum, the lunella is less developed and in a more lateral position; on parietum, the parietal lamella is longer; genitalia with thinner and longer diverticulum of the bursa copulatrix and shorter copulatory duct; the clausilium is more roudend.

Mauritanica tristrami nouirasaidi n. ssp. - Figs. 26–32, 35, 36, 82 - http://zoobank.org/d0066e1c-93dc-48e3-8b33-4dc82b54007f

Clausilia philora - Letourneux in Letourneux & Bourguignat, 1887: 112 - Kessera [not Letourneux, 1887]

EXAMINED MATERIAL. Tunisia, Kesra, 7.V.1992, 1 ex, leg. I. Sparacio (CS 3280/1); Plateau de Kesra, 35°48'34.89"N 9°22'22.45"E, 19.VII.2018, 2 paratypes, leg. G. Domina, (CS 5036/2); Kesra, 35°48'32.6"N 9°22'17.3"E, 27.IX.2019, 34 paratypes, leg. I. Sparacio (CS 5070/38) (Figs. 27–32, 36); idem, holotype (Fig. 26) (MSNG); idem, 1 paratype (MZUF); idem, 1 paratype (MCZR-M-TYPE 00253); idem, 4 paratypes (CL T429–T432).

DESCRIPTION OF THE HOLOTYPE. Shell sinistral, elongated, with 14 whorls slightly convex; H: 21.3 mm, D: 4 mm (Fig. 26); the apical and subapical whorls are convex and smooth; the following 5 whorls are brownish-gray in colour, the following whorls are brown in colour with white ribs; R2: 8. Basal and dorsal keels moderatly high separated by a large furrow.

On palatum there are: a thin sutural plica, a raised principal plica protruding beyond the lunella, upper palatal plica developed only in its posterior portion, lunella dorsolateral little, raised and fused with rudimentary subclaustralis.

On parietum, starting from the suture, there are: a parietal lamella that surpasses the spiral lamella, the latter is well marked and gradually decreases in height towards the aperture, columellar lamella high, ending near to columellar edge, subcolumellar lamella higher in the outer end, ending near or on to internal border of peristome, well visible in front view.

Clausilium plough-like with sub-rectangular basal plate, and straight palatal and columellar edges.

Genitalia. Distal genitalia similar to that of nominotypical subspecies, distinguished by penis and vagina slightly longer (2.6 mm), longer diverticulum of the bursa copulatrix (6.5 mm) and shorter penial pseudopapilla.

Body. Animal brown in colour with a paler band on the back.

VARIABILITY. Shell usually not decollated with 14–15 whorls; the apical and subapical whorls are convex and smooth or with very minute ribs; H: 20.5–24 mm (mean: 22.25 mm), D: 4–4.5 mm (mean: 4.25 mm); R2: 7–10; genitalia as in the holotype (Figs. 27–32).

ETYMOLOGY. This new subspecies is dedicated to the Prof. Saïd Nouira (Tunis, Tunisia), Tunisian scholar and naturalist.

DISTRIBUTION AND BIOLOGY. *Mauritanica tristrami nouirasaidi* n. ssp. is known only for the surroundings of Kesra (Siliana Governorate). It lives on calcareous rocks (Figs. 35, 36).

REMARKS. Little-known population, cited by Letourneux & Bourguignat (1887: "*environs de Kessera*") and attributed to *M. philora* (see below).

This new subspecies is mostly distinguishable from the others Tunisian *Mauritanica*, particularly, for a developed subcolumellar lamella reaching and going beyond the internal edge of the peristome and from the other two subspecies of *M. tristrami* for the shorter shell, fewer number of whorls, moderately high basal and dorsal keels, separated by a large furrow, for the longest diverticulum of the bursa copulatrix.

Mauritanica philora philora (Letourneux, 1887) - Figs. 37–43, 51, 82

Clausilia philora - Letourneux in Letourneux & Bourguignat, 1887: 112–113 - locus typicus: El Kef. Other mentioned locality: Kessera

Clausilia (*Mauritanica*) *philora* - Westerlund, 1890: 116 - Tunesien

Clausilia philora - Westerlund, 1901: 71 - Tunesia

Charpenteria (*Mauritanica*) *tristrami philora* - Nordsieck, 2007: 54

Charpenteria (*Mauritanica*) *tristrami philora* - Abbès, 2012: 45, pl. 4 fig. A - dans la région de Djebba

Mauritanica tristrami philora - Sparacio et al., 2019: 52, 55 - El Kef

EXAMINED MATERIAL. Tunisie, Kef, Crêtes du Kef (= El-Kef = El Kaf) - collection Bourguignat G 16 - *Clausilia philora* Letourneux in Letourneux & Bourguignat, 1887 - syntype, MHNG-MOLL-108072 (Fig. 37). Tunisia, El Kef, 13.V.1987, 4 exx, leg. I. Sparacio (CS 3154/4); idem, 2 exx (CL T206–T207); El Kef, 36°11'45.8"N 8°43'31.0"E, 16.III.2018, 85 exx, leg. I. Sparacio (CS 4460/85) (Figs. 38–43, 51); idem, 8 exx (CL T433–T440).

DESCRIPTION. Shell fusiform, sinistral, usually not decollated with 13–14 whorls, shell decollated with 8–10 remaining whorls in adult shell; shell not decollated with obtuse apex (Fig. 38), H: 19–22.5 mm (mean: 20.75); D: 3.9–4.3 mm (mean: 4.1); the apical and subapical whorls are convex and smooth or with very minute ribs; the following 5 whorls are yellowish in colour, the remainig whorls are light brown in colour with regular and slightly elevated ribs; R2: 11–15; the space between the ribs is micro-reticulated; spire slowly and regularly growing, umbilicus closed; suture shallow; basal and dorsal keels indistinct; aperture about 1/5 of shell height, ovoidal-subsquared; peristome continous, slightly thickened, reflected, superiorly attached to the wall of last whorl.

On palatum (Fig. 39) there are: a thin sutural plica, sometimes absent, a raised principal plica protruding beyond the base of the lunella, upper palatal plica developed only in the posterior portion, lunella dorsolateral, its base is fused with the well raised subclaustralis plica.

On parietum (Fig. 40), starting from the suture, there are: a parietal lamella that reaches the spiral lamella, the latter is well marked and gradually decreases in height towards the aperture, columellar lamella high within and just reaching the columellar margin, subcolumellar lamella short, generally not visible in frontal view.

Clausilium (Fig. 41) plough-like with sub-rectangular basal plate, slighlty convex palatal edge and straight columellar edge.

Genitalia (Figs. 42, 43). Genitalia are similar in size and shape a to that of *M. tristami*: vagina (1.5–18 mm), copulatory duct (2.2–2.3 mm), bursa copulatrix duct + bursa copulatrix (3.8 mm), diverticulum of the bursa copulatrix (4.5–4.8 mm); epiphallus (3–3.4 mm), penis (2.9–3.2 mm). Penial pseudopapilla conic.

Body. Animal dark brown; skin tubercle oval-elongated; upper tentacles rather short, cylindro-conical, with black eyes; foot long with sole paler than body.

DISTRIBUTION AND BIOLOGY. *Mauritanica philora* lives on the calcareous rocks in the surroundings of El Kef, northwestern Tunisia: "*le type a été recueilli sur les crêtes d'El Kef, où il parait assez abondant*" (Letourneux & Bourguignat, 1887) (Fig. 51).

REMARKS. This taxon was described as a distinct species and was considered such by Westerlund, (1890; 1901).

Recently, Nordsieck (2007) considers it a subspecies of *M. tristrami*. Abbes (2012), following this taxonomic approach, observes that further studies would be needed to confirm this classification, considering that the two populations live in two distinct geographical areas: [*M. tristrami tristrami*] "*aux Nord est de la Tunisie particulièrement Djbel Zaghouan et Djebel Reças alors que la deuxième* [*M. tristrami philora*] *n'a été trouvée que dans la région de Djebba située au nord ouest de la Tunisie*".

Mauritanica philora philora differ from *M. tristrami* ssp. for: the shorter shell (19–22.5 mm in *M. philora*; 20.5–26 mm in *M. tristrami*), fewer whorls (13–14 in *M. philora*; 14–17 in *M. tristrami*); thinner and more numerous ribs (R2: 11–15 in *M. philora*; R2: 7–12 in *M. tristrami*); subcolumellar lamella shorter generally not visible in frontal view (visible in *M. tristrami*); more developed subclaustralis.

Mauritanica philora bognannii n. spp. - Figs. 44–50, 52–54, 82 - http://zoobank.org/f84ead40-ddd2-4a7a-8884-bf4071d0ab5f

Charpenteria (*Mauritanica*) *tristrami philora* - Abbès, 2012: 45, pl. 4 fig. A - dans la région de Djebba

EXAMINED MATERIAL. Tunisia, Teboursouk surroundings, 13.V.1987, 2 paratypes, leg. I. Sparacio (CS 3153/2); Djebba, 24.VI.2007, 3 exx, leg. I. Abbes (SUT, see also Abbes, 2012: 46). Teboursouk, Dougga, 36°25'36.0"N 9°13'07.4"E, 16.III.2018, 48 paratypes, leg. I. Sparacio (CS 4461/52) (Figs. 45–50, 53–54); idem, holotype (Fig. 44) (MSNG); idem, 1 paratype (MZUF); idem, 1 paratype (MHNG); idem, 1 paratype (MCZR-M-TYPE 00254); idem, 4 paratypes (CL T441–T444).

DESCRIPTION OF HOLOTYPE. Shell fusiform, robust, with 13 convex whorls; H: 20 mm, D: 4.1 mm (Fig. 44); the apical and subapical whorls are convex and smooth; the following 5 whorls are yellowish in colour, the last whorls are dark brown in colour with white ribs; R2: 16. Basal and dorsal keels slightly elevated separated by a superficial furrow.

On palatum there are: a thin sutural plica, a long and raised principal plica protruding beyond the lunella, upper palatal plica developed only in the posterior portion, lunella dorsolateral, its base is fused with the well raised subclaustralis plica.

On parietum, starting from the suture, there are: a parietal lamella that reaches or surpasses the spiral lamella, the latter is well marked and gradually decreases in height towards the aperture, columellar lamella developed and just reaching the columellar edge, subcolumellar lamella just reaching the internal peristome border, little visible in frontal view.

Clausilium plough-like with oval basal plate, sutural angle bent up, convex palatal edge and straight columellar edge.

Genitalia are similar in size and shape a to that of nominotypical subspecies, distinguished by slightly longer vagina (1.8–2 mm) and diverticulum of the bursa copulatrix (5.5–5.8 mm). Penial pseudopapilla conic.

Body. Animal similar to *M. philora philora*, entirely black.

VARIABILITY. Shell not decollated with 13–14 convex whorls, the last 5 whorls are yellowish in colour or dark brown; shell decollated with 7–10 whorls remainig in adult shell; shell H: 19.2–22 (mean: 20.6 mm), D: 4–4.6 mm (mean: 4.3 mm); R2: 15–20; sometimes, other thin and incomplete ribs are found next to the main ribs; genitalia as in the holotype (Figs. 45, 49, 50).

ETYMOLOGY. To Patrizia Bognanni from Palermo (Italy), artistic photographer.

DISTRIBUTION AND BIOLOGY. This new subspecies lives on rocks and limestone walls, in the surroundings of Teboursouk, Dougga (Figs. 52–54) and Djebba, in central-northern Tunisia.

REMARKS. *Mauritanica philora bognannii* n. spp. differs from *M. philora philora* for the shape of the shell more robust and more wide (H/D = 4.95, it is 5.2 in *M. philora philora*), the darker brown color with the most evident white wider and higher ribs, the more numerous ribs (R2: 15–20), more developed parietal and subcolumellar lamella, diverticulum of the bursa copulatrix and bursa copulatrix duct slightly longer, clausilium oval-shaped, basal and dorsal keels slightly elevated but present.

We also attribute to this new subspecies the populations of Djebba of which we have examined few specimens (cited also by Abbes, 2012, sub *C. tristrami philora*).

Mauritanica perinni polygyra (O. Boettger, 1879) - Figs. 56–63, 70, 82

Clausilia (*Mauritanica*) *polygyra* - Boettger in Kobelt, 1879: 153, tav. 177, fig. 1793 - Ruinen von Carthage

Clausilia (*Mauritanica*) *polygyra* - Westerlund, 1884: 73 - Tunis

Clausilia Perinnei - Letourneux & Bourguignat, 1887: 113 - Djebel Zaghouan

Clausilia (*Mauritanica*) *perinni* - Westerlund, 1890: 116 - Alg. (Djebel Thaya u. Dj. Guerar), Tunes (Dj. Zaghouan).

Clausilia perinnei - Westerlund, 1901: 72 - Algeria, Tunesia

Charpenteria (*Mauritanica*) *perinni polygyra* - Nordsieck, 2002: 27, 29, 29, 35, 36 - Djebel Zaghuan

Charpenteria (*Mauritanica*) *perinni polygyra* (= *zaghouanica*) - Nordsieck, 2002: 36

Charpenteria (*Mauritanica*) *perinni polygyra* - Nordsieck, 2007: 54

Charpenteria (*Mauritanica*) *perinni polygyra* - Abbès, 2012: 47, pl. 4 fig. C - Djebel Zaghouan

Mauritanica perinni polygyra - Scheel & Hausdorf, 2012: 3799, 3801

EXAMINED MATERIAL. *Mauritanica perinni* Letourneux, 1876: Algeria, Djebel Thaya (*Clausilia perinnei* Letourneux, 1876 - syntype, MHNG-MOLL-108066) (Fig. 55).

Mauritanica perinni polygyra: Tunisia, Djebel Zaghouan, 14.V.1987, 2 exx, leg. I. Sparacio (CS 3159/2); SE Zaghouan, 36°23'14.1"N 10°08'39.8"E, 7.V.1992, 85 exx, leg. I. Sparacio (CS 3276/85) (Figs. 56–61, 63, 70); idem, 8 exx (CL T445–T452); Djebel Zaghouan, near Hotel Les Nymphes, 36°23'21.9"N 10°08'17.3"E, 8.IV.2014, 18 exx, leg. I. Sparacio (CS 4020/18); Tunisia, Djebel Zaghouan, 36°22'00"N, 10°07'14"E, 18.VII.2018, 1 ex, leg. G. Domina (CS 5032/1); Djebel Zaghouan, SW Zaghouan, 36°23'14.1"N 10°08'39.8"E, 30.IX.2019, 13 exx, leg. I. Sparacio (CS 5071/13).

DESCRIPTION. Shell elongated, fusiform, sinistral, robust, decollated or not; shell decollated with 9-12 whorls remaining in adult shell, shell not decollated with 15–17 little convex whorls; obtuse apex, yellowish brown protoconch and purplish-brown teleoconch, (Figs. 56, 62, 63); H (not decollate): 25–27.5 mm; D: 4–4.9 mm; apical and subapical whorls convex and smooth or very finely ribbed; the following whorls with very minute and just raised ribs; in the last six whorls ribs more evident and decrease in height from the base to the suture; R2: 8–11; spire slowly and regularly growing, umbilicus closed; suture shallow; basal keel little distinct, cervical swelling present; aperture about 1/5 of shell height, ovoidal-subsquared; peristome continous, thickened, reflected, superiorly attached to the wall of last whorl.

On palatum (Fig. 57) there are: a sutural plica, a raised principal plica protruding beyond the lunella, upper palatal plica developed only in the posterior portion, lunella dorsolateral raised and fused with the very little subclaustralis plica.

On parietum (Fig. 58), starting from the suture, there are: a parietal lamella that surpasses the spiral lamella, the latter is well marked and gradually decreases in height towards the aperture, columellar lamella high and just reaching the columellar edge, subcolumellar lamella not reaching the internal peristome border, visible in front view.

Clausilium (Fig. 59) plough-like with sub-rectangular basal plate, convex palatal edge and straight columellar edge.

Genitalia (Figs. 60, 61). Distal genitalia are similar in size and shape to that of *M. tristami* ssp.: vagina (2.4–2.6 mm), copulatory duct (3–3.4 mm), penis (3–3.2 mm), epiphallus (3.1–3.4 mm) but distinguished by longer bursa copulatrix duct + bursa copulatrix (5–5.2 mm) and very longer diverticulum of the bursa copulatrix (8.2–8.6 mm). Penial pseudopapilla well developed, conic-elongated, with rounded apex. Inner wall of the vagina with thin longitudinal pleats.

Body. Animal similar to previous *Mauritanica species*, black, elongated; foot with sole paler than body.

DISTRIBUTION AND BIOLOGY. *Mauritanica perinni polygyra* was described (O. Boettger, 1879) from "*Ruinen von Carthage*" and the figure attached to the work (O. Boettger in Kobelt, 1879; fig. 1793) really refers to this species (Fig. 62). Westerlund (1884) reports this species for "*Tunis*", but Letourneux & Bourguignat (1887: sub *Clausilia Perinnei*) identify "*Djebel Zaghouan*" as the true locality of *M. perinni polygyra* in Tunisia.

It is known only from Djebel Zaghouan, where it lives on calcareous rocks, in cavities and under stones (Figs. 67–70).

REMARKS. "*Mauritanica*" *polygyra* is considered a subspecies of *M. perinni* from Algeria (Nordsieck, 2002, 2007; Abbès, 2012), type locality "*sous détritus à l'entrée d'une des cavernes du Djebel Thaya, montagne située entre Jemmapes et Gueima, dans la provincie de Costantine*".

Based on original description (Bourguignat, 1876) and photographic examination of the type material (Fig. 55), *M. perinni perinni* is morphologically distinct from its subspecies *polygyra* for smaller dimensions (H: 24 mm), lower number of whorls (14), more robust shell, opaque and more finely striated shell surface, especially in the cervical area; larger aperture with wider and callous peristome.

Mauritanica perinni and *M. polygyra* could be considered two distinct species, if we also take into account their geographical isolation. However, due to the lack of greater knowledge on the morphological and anatomical variability of *M. perinni* , we prefer to report the two taxa according to the current systematics (see cited references).

Mauritanica perinni zaghouanica (Letourneux, 1887) - Figs. 64–66, 82

Clausilia Perinnei Var. *zaghouanica* - Letourneux & Bourguignat, 1887: 113 - Djebel Zaghouan
Clausilia (*Mauritanica*) *perinni* v. *zaghouanica* - Westerlund, 1890: 116 - Tunes (Djebel Zaghouan)
Clausilia perinnei Var. *zaghouanica* - Westerlund, 1901: 72 - Tunesia
Charpenteria (*Mauritanica*) *perinni polygyra* (= *zaghouanica*) - Nordsieck, 2002: 36
Charpenteria (*Mauritanica*) *perinni polygyra* - Abbès, 2012: 47, pl. 4 fig. C

EXAMINED MATERIAL. Tunisia, Djebel Zaghouan, (*Clausilia perinnei* var. *zaghouanica* Letourneux, 1876 - syntype, MHNG-MOLL-108070) (Fig. 65). Tunisia, Zaghouan, Oued Dalia (= Dalya, Daliya), 5.X.2008, 6 exx, leg. I. Abbes (SUT, see also Abbes, 2012 p. 47 and pl. 4 fig. C); Tunisia, Zaghouan, 1 ex (MZUF GC/61859).

DESCRIPTION. *Mauritanica perinni zaghouanica* (Figs. 64–66) differs from *M. perinni polygyra* for bigger size (H: 27.5–30 mm, D: 4.9–5.5 mm); more numerous whorls (17–18), more convex whorls 3–7; with fewer ribs (R2: 7–9) clearly visible only in the last 4 whorls; the basal and dorsal keels are distinct, separed by a large and shallow furrow. On parietum, parietal lamella does not reach the spiral lamella; subcolumellar lamella not reaching the internal peristome border, visible in front view.

DISTRIBUTION AND BIOLOGY. *Mauritanica perinni zaghouanica* was found in south-western slope of Djebel Zaghouan.

REMARKS. *Mauritanica perinni zaghouanica* is little known in the malacological literature; recently, Nordsieck (2002) considered it a synonym of *M. perinni polygyra* (see also Nordsieck, 2007 and Abbès, 2012).

We have not found specimens of "*zaghouanica*" mixed within the populations of "*polygyra*". The few specimens of typical "*polygyra*" of greater size and with a higher number of whorls do not show the morphological characters of *zaghouanica*, particularly the shell more robust, more convex whorls, fewer ribs, the basal and dorsal keels distinct.

Pending further research, we prefer to consider *M. perinni zaghouanica* distinct at a subspecific level.

Mauritanica cossoni (Letourneux, 1887) - Figs. 71–77, 80–82

Clausilia cossoni - Letourneux in Letourneux &

Bourguignat, 1887: 113–114 - locus typicus: "*Dans les anfractusosités des rochers, au Cap Bon*"

Clausilia (*Mauritanica*) *cossoni* - Westerlund, 1890: 116 - Tunesien

Clausilia cossoni - Westerlund, 1901: 72 - Tunesia

Clausilia (*Mauritanica*) *cossoni* - Nordsieck, 2002: 29, 31, 35, fig. 5 - Cap Bon (lectotype)

Clausilia (*Mauritanica*) *cossoni* - Nordsieck, 2007: 54

Clausilia (*Mauritanica*) *cossoni* - Abbès, 2012: 45, pl. 4 fig. A - Diar el ousfen

Mauritanica cossoni - Cossignani 2014: 189 - Tunisia

EXAMINED MATERIAL. Cape Bon peninsula, Cape Bon, 300 m, 14.V.1987, 6 exx, leg. I. Sparacio (CS 3157/6); Cape Bon, near Al Huwariyah, 37°03'45.8"N 11°01'51.8"E, 6 exx, 15.III.2018, leg. I. Sparacio (CS 4459/6); idem, 26.IX.2019, 78 exx (CS 5072/78) (Figs. 71–77, 80–82); idem, 6 exx (CL T453–T458); Cap Bou peninsula, Cap Bon, 350 m, under stones, ante 2014, ex coll. M. Calò 1504935, 1 ex (CL T424).

DESCRIPTION. Shell elongated, fusiform, sinistral, not decollated, obtuse apex, with 11–12 convex whorls; brown or blackish-brown in colour with sutural papillae scattered and sometimes slightly evident; H: 16–19 mm; D: 3.8–4.5 mm (Figs. 71, 72); apical and subapical whorls convex and very finely ribbed, the following whorls with minute, oblique and just raised ribs sometimes incomplete or obsolete; R2: 12–15; spire slowly and regularly growing, umbilicus closed; suture shallow; basal keel distinct, cervical swelling present, separated by a shallow furrow; aperture about 1/6 of shell height, ovoidal-subsquared; peristome white, continous, slightly thickened, reflected, superiorly attached to the wall of last whorl.

On palatum (Fig. 73) there are: a thin sutural plica, a long and raised principal plica, slightly wider in its posterior portion and protruding beyond the lunella, upper palatal plica developed only in the posterior portion, lunella dorsal or dorsolateral, raised and fused with the well developed lower palatal plica (subclaustralis + basalis).

On parietum (Fig. 74), starting from the suture, there are: a parietal lamella that reaches the internal border of peristome and with the inner extremity that surpasses the spiral lamella, the latter is well marked and gradually decreases in height towards the aperture, columellar lamella more o less high and reaching the columellar edge, subcolumellar lamella generally visible in front view, reaching the internal peristome border.

Clausilium (Fig. 75) plough-like with sub-rectangular basal plate, slightly convex palatal edge and straight columellar edge.

Genitalia (Figs. 76, 77) similar to that of other *Mauritanica* but distinguished by a very short vagina (1.2–1.8 mm), a very long and robust copulatory duct (4.5–5 mm), a long diverticulum of the bursa copulatrix (5–5.3 mm), and shorter and cylindrical duct of bursa copulatrix + bursa copulatrix (3.5 mm).

Penial pseudopapilla conic with pointed apex and smaller than the other *Mauritanica* species. Inner wall of the vagina with thin longitudinal pleats and a little annular pad in the distal part.

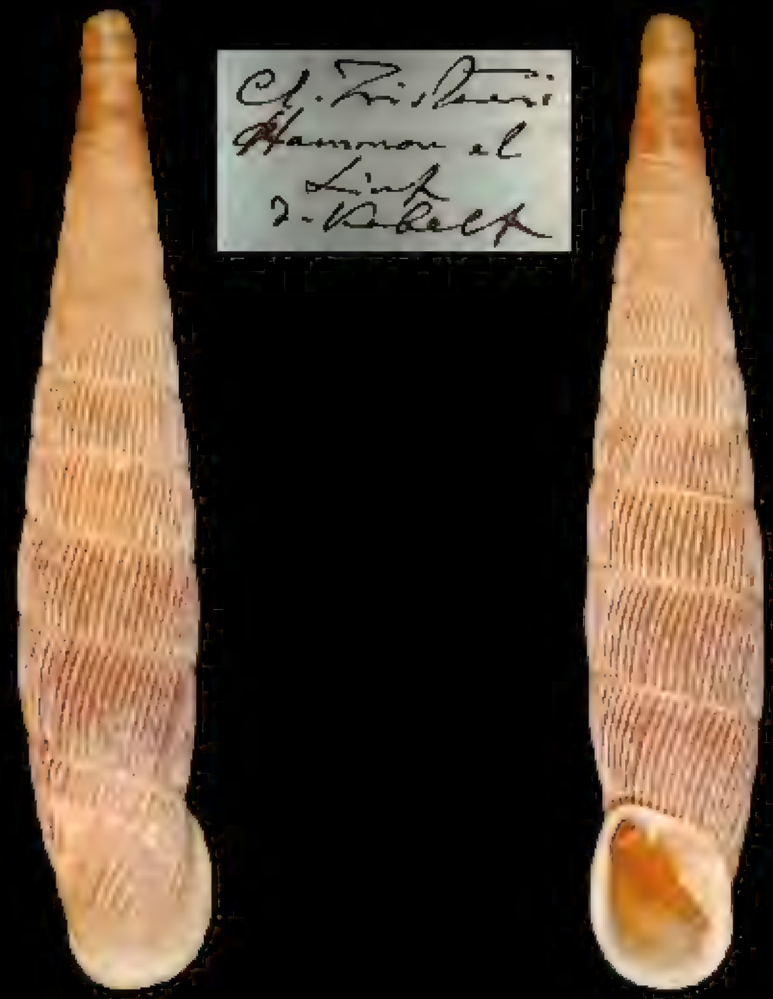
Body. Animal similar to other *Mauritanica*, relatevely long, black; foot narrow, black.

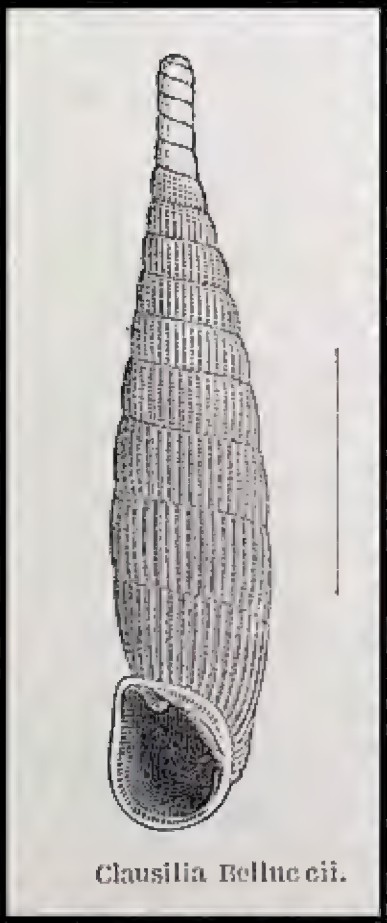
DISTRIBUTION AND BIOLOGY. *Mauritanica cossoni* is known only from Cape Bon, north-eastern Tunisia (Figs. 78, 79).

It lives on rocks but it is common in the wet bedding of a pine forest (*Pinus pinea* L.), under stones and debris (Figs. 80, 81).

REMARKS. Nordsieck (2002) selected a lectotype of *M. cossoni*, from the only syntype of the Bourguignat collection (NMG 8062, Tunisia: Cap Bon) that was available, to facilitate the study with similar species. In the same work, Nordsieck (2002) classified the *Mauritanica* species into two groups: *tristrami* group (shell with withe surface layer) including *tristrami*, *philora*, *perinni*, *polygyra*, and *numidica* group (shell with sutural papillae) including *cossoni* and *numidica*.

Mauritanica cossoni appears distinct from all Tunisian *Mauritanica* both geographically, as it lives only in the northern part of Cape Bon, the Tunisian region closest to Sicily, and morphologically for the smaller shell, with lower number of whorls, the presence of a basalis (absent in all other *Mauritanica* species) and for the genitalia with a short vagina and a very long copulatory duct and smaller penial pseudopapilla. For all these characters *M. cossoni* appears closer to the genus *Siciliaria* s. str. than to *Mauritanica*. However, in the absence of molecular data we prefer to maintain the current systematics.


1
Cl. Tristrami
Hammon el
Lif


2
Clausilia Bellucii.

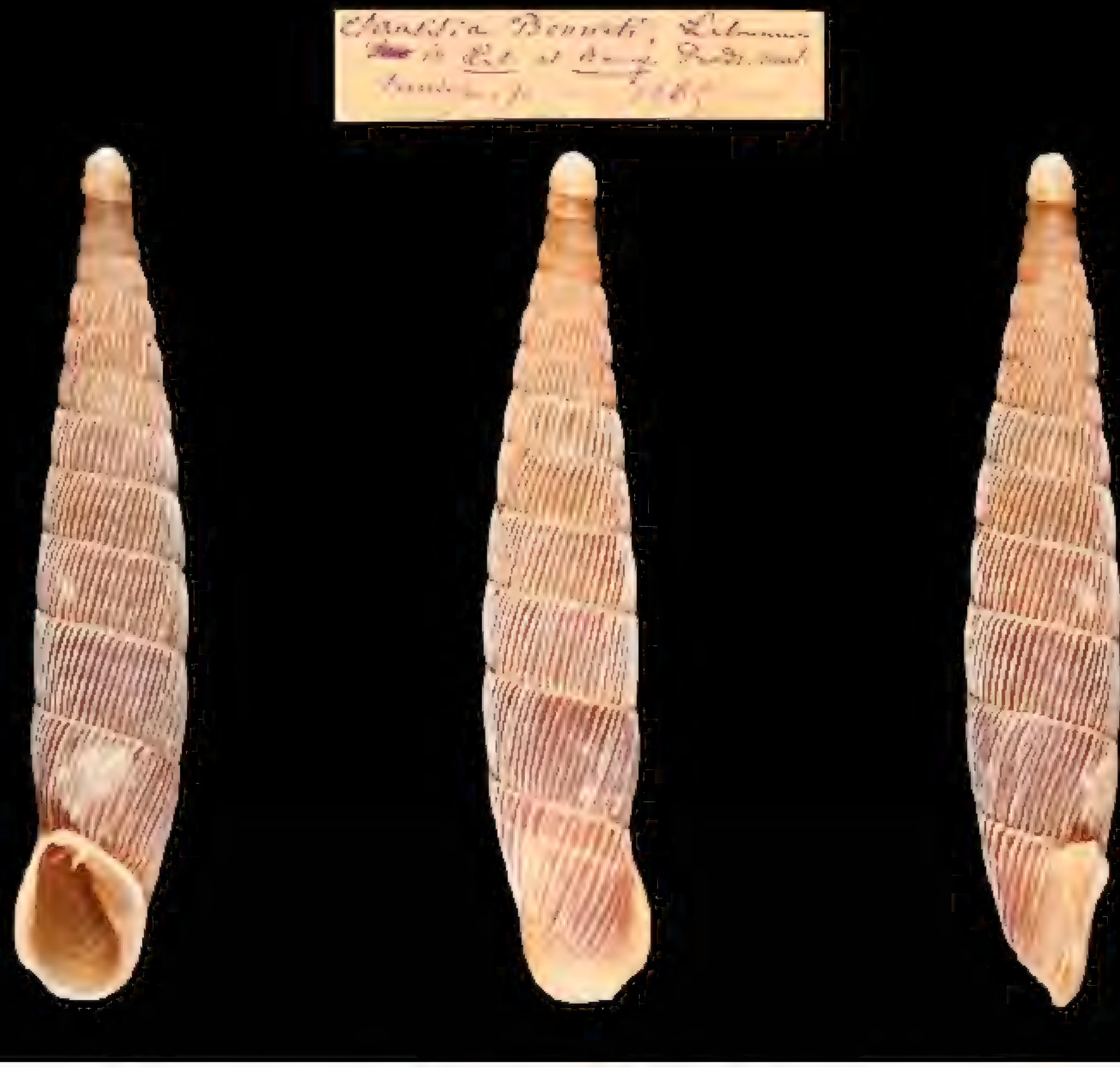
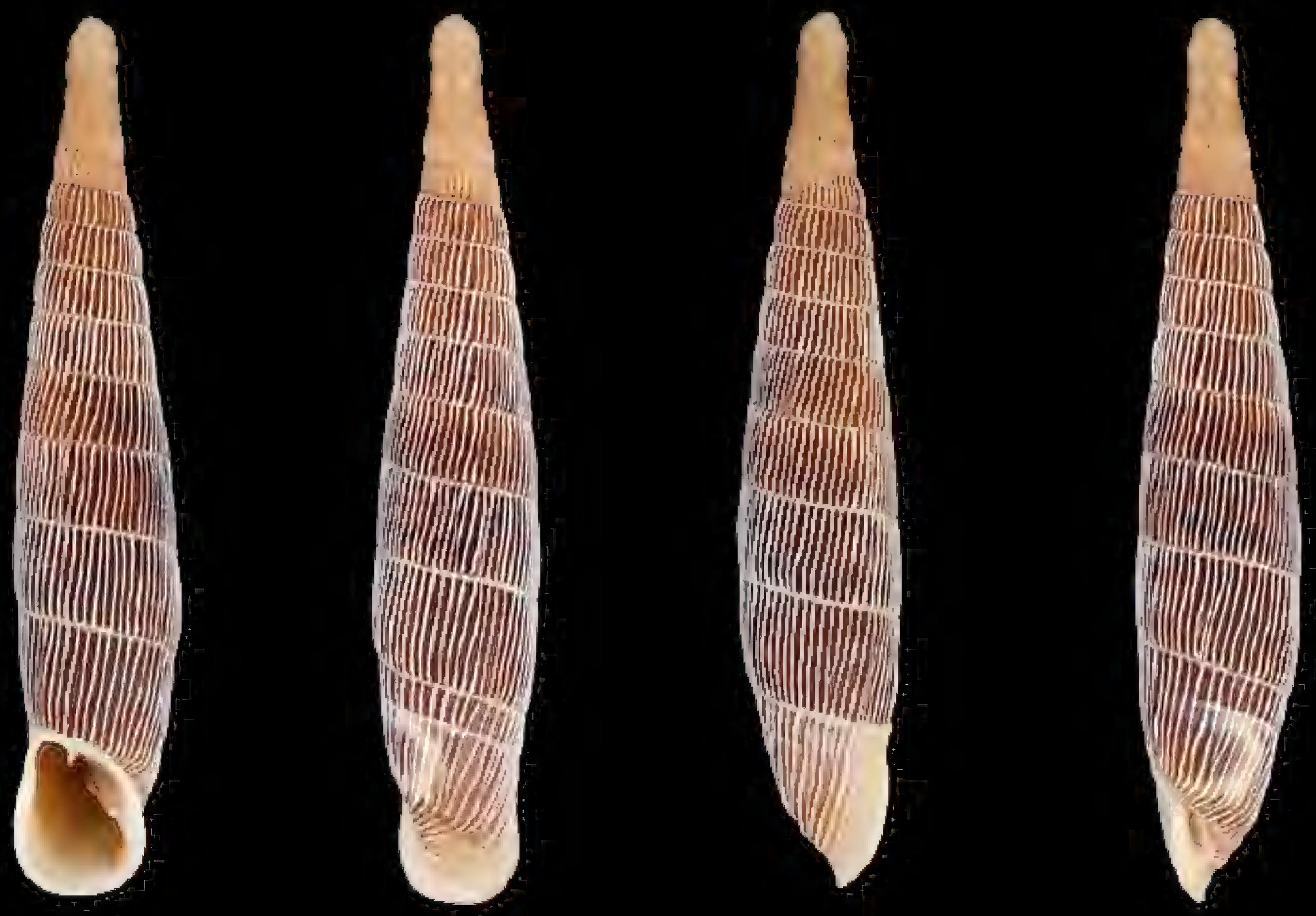

3
Clausilia Bonneti, Let

Figure 1. *Mauritanica tristrami tristrami*, Hamman el Lif, ex coll. Monterosato (H = 24 mm), with original label. Figure 2. *Clausilia belluccii* by Issel, 1880 p. 278. Figure 3. *Clausilia bonneti* Letourneux 1887, Djebel-Bou-Kournine, syntype, with original label (H = 23.4 mm).



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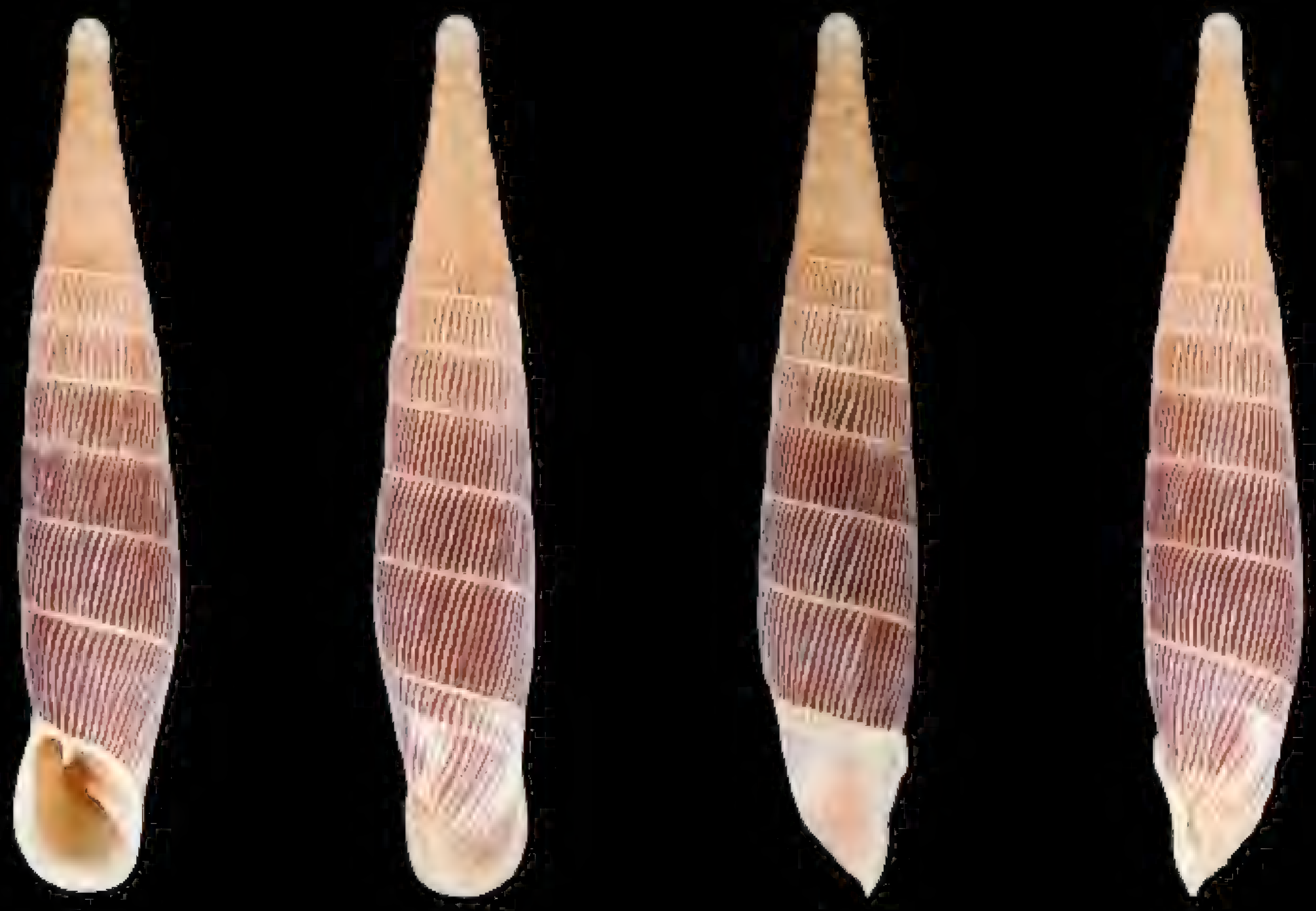
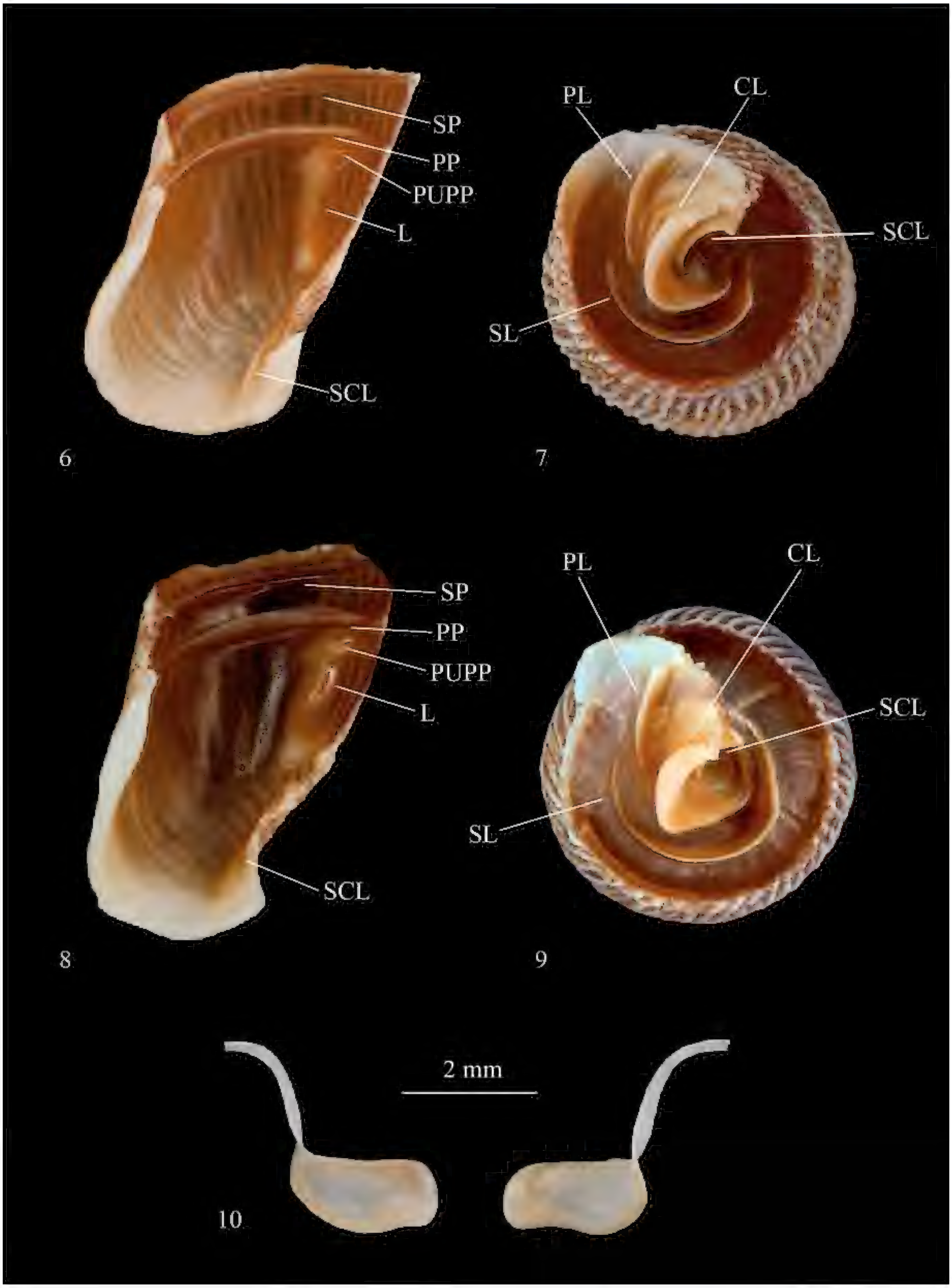


5

Figure 4. *Mauritanica tristrami tristrami*, Djebel Reças: Mornag, H = 24.5 mm.
Figure 5. *Mauritanica tristrami tristrami*, Djebel Zaghouan, H = 24.2 mm.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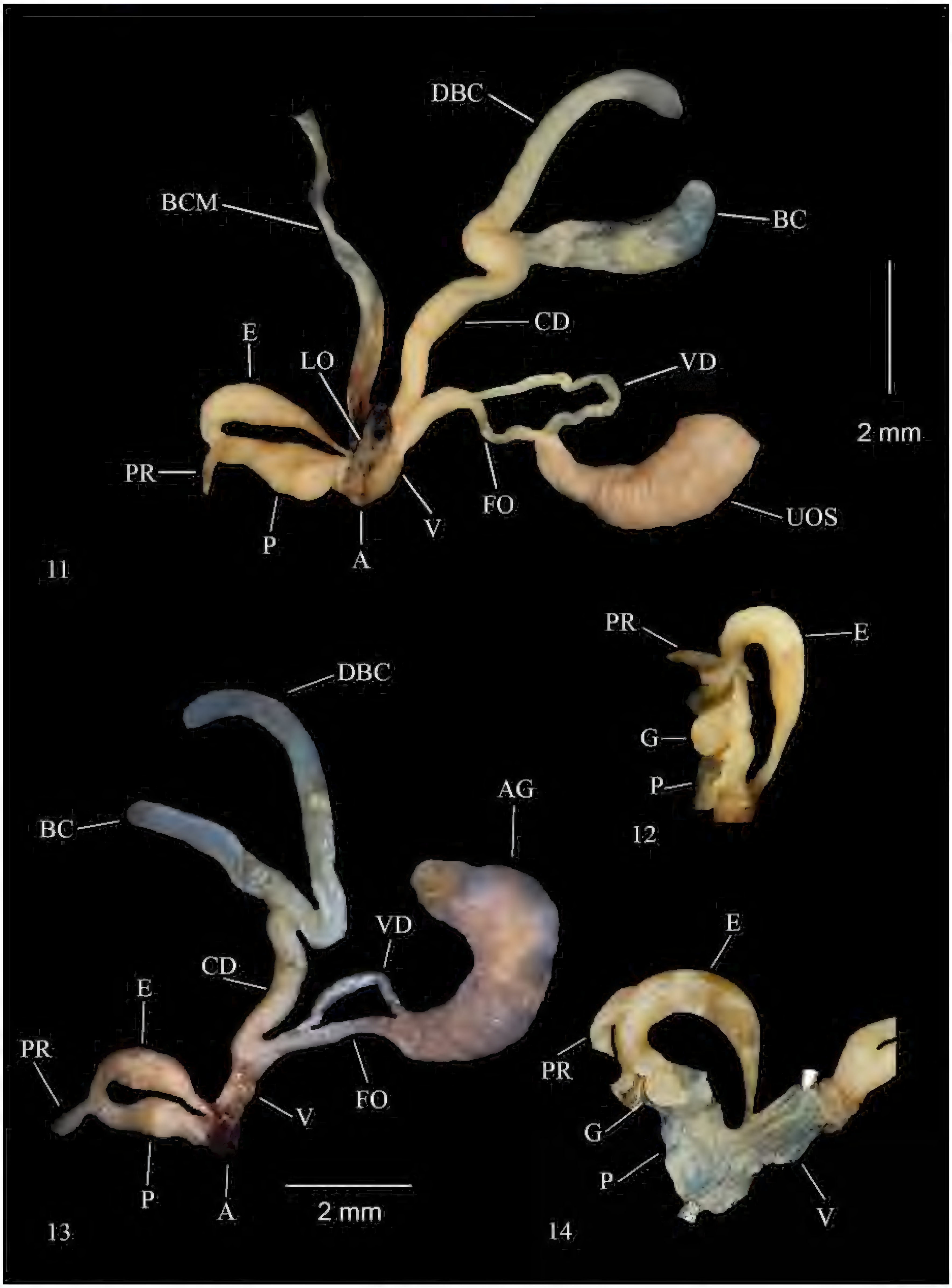
Figures 6–10. *Mauritanica tristrami tristrami*, Djebel Reças: Mornag. Fig. 6: palatum. Fig. 7: parietum. Fig. 8: palatum. Fig. 9: parietum. Fig. 10: clausilium.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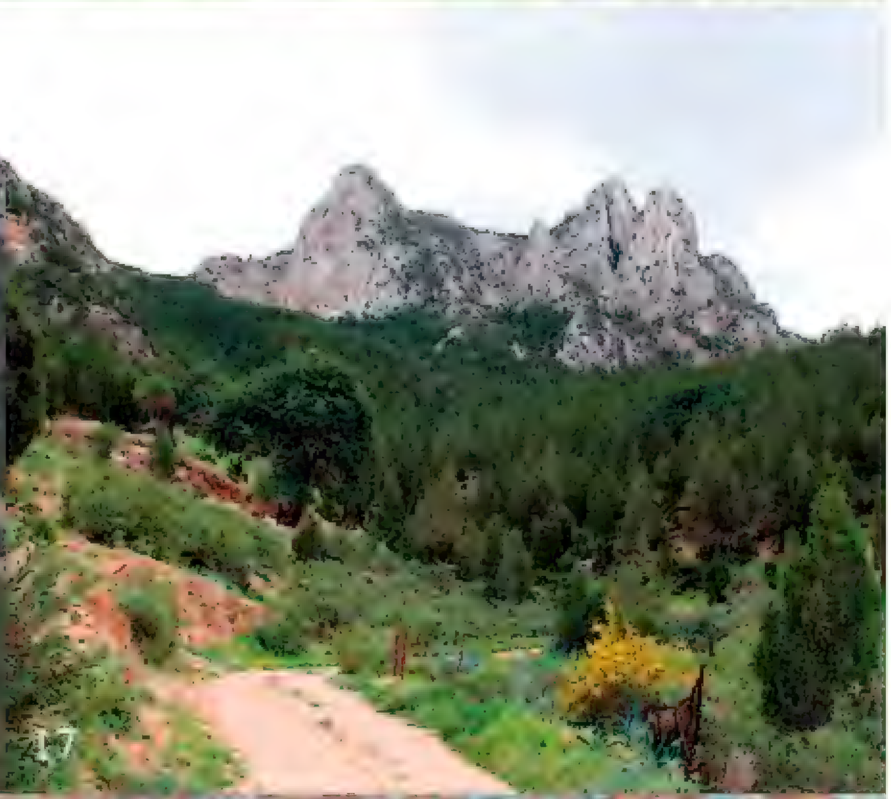
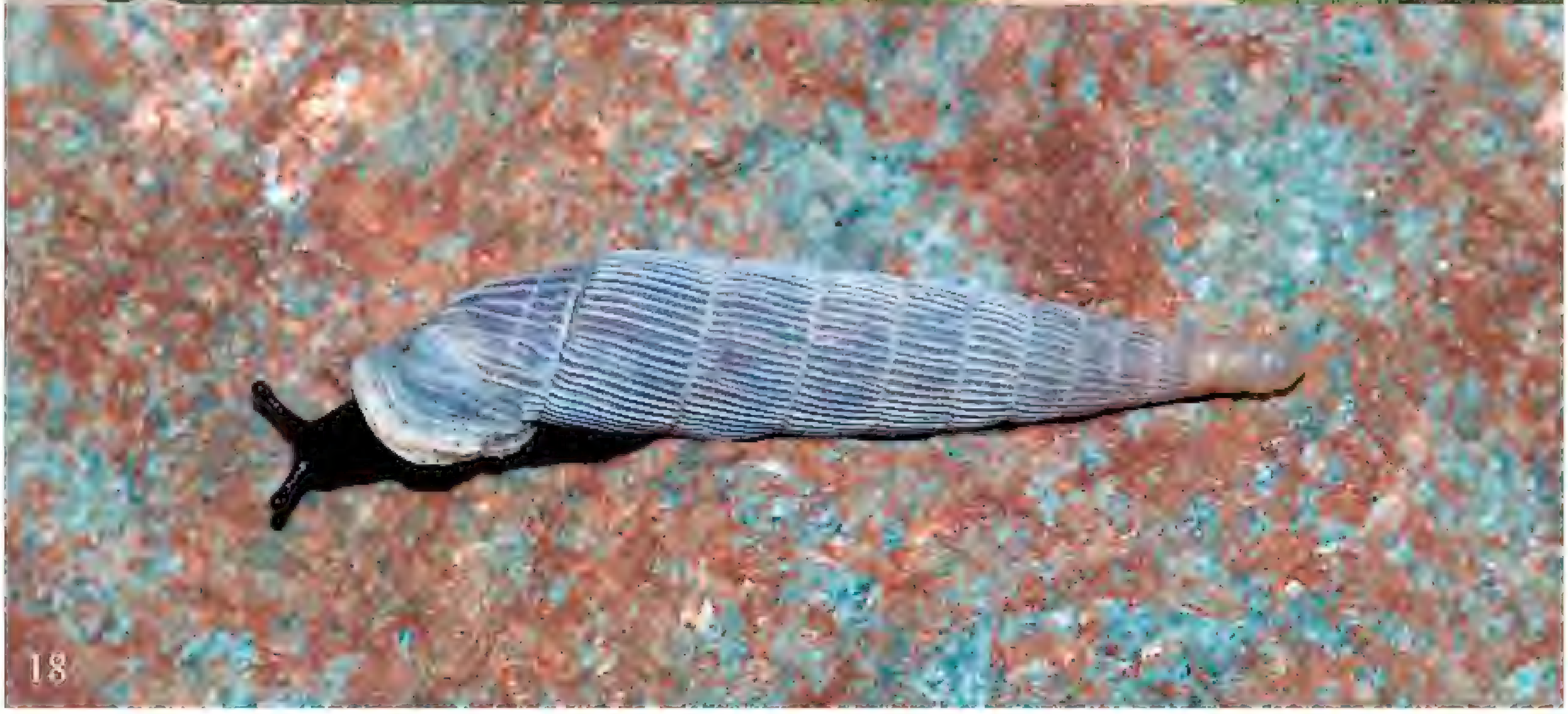
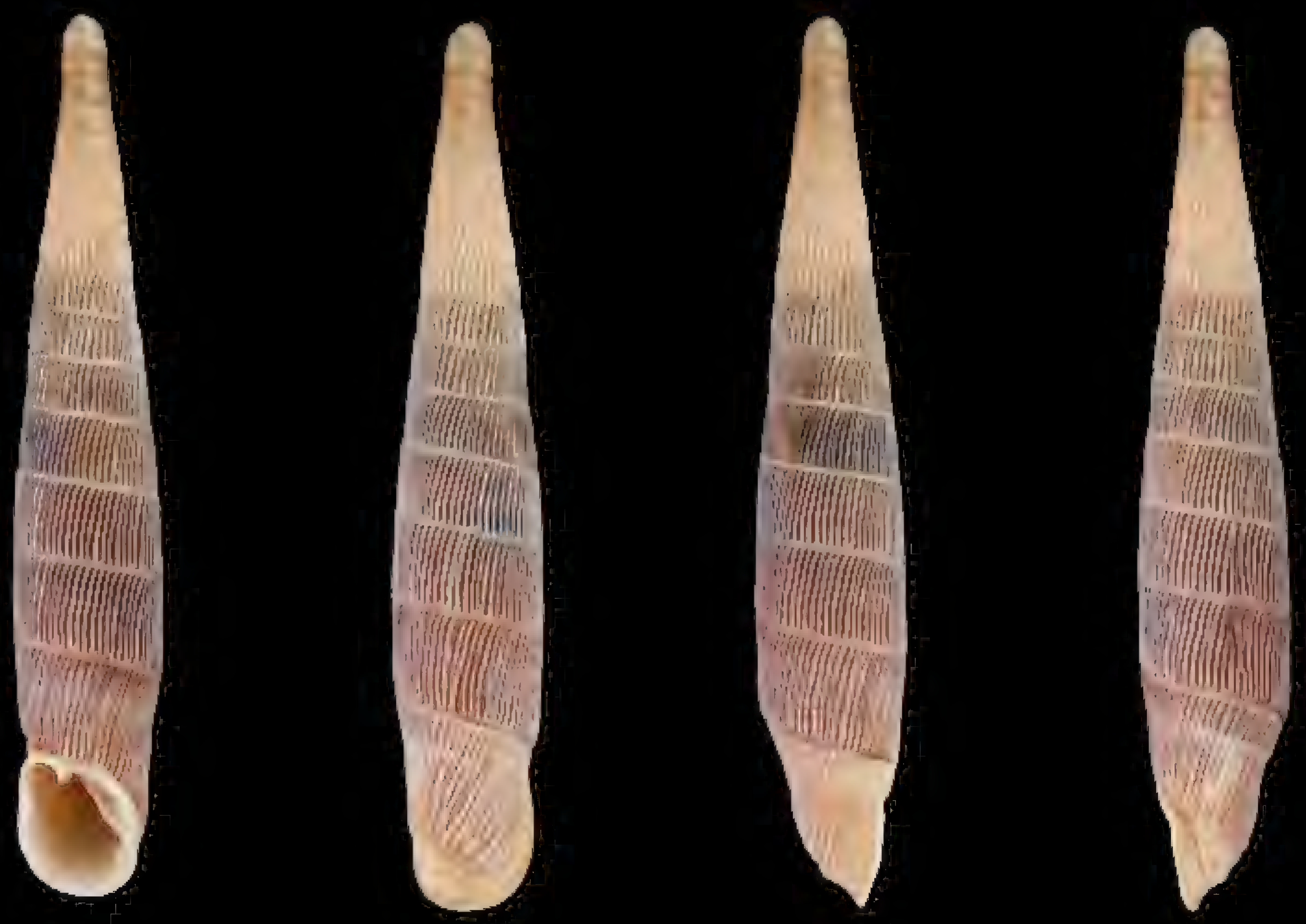
Figures 11–14. *Mauritanica tristrami tristrami*, Djebel Reças: Mornag. Fig. 11: genitalia. Fig. 12: inner structures of the penis. Fig. 13: genitalia. Fig. 14: inner structures of the penis and vagina.





Figures 15, 16. Tunisia, landscapes of Djebel Reças. Figure 17. Djebel Reças, Mornag.
Figure 18. Idem, *Mauritanica tristrami tristrami*.



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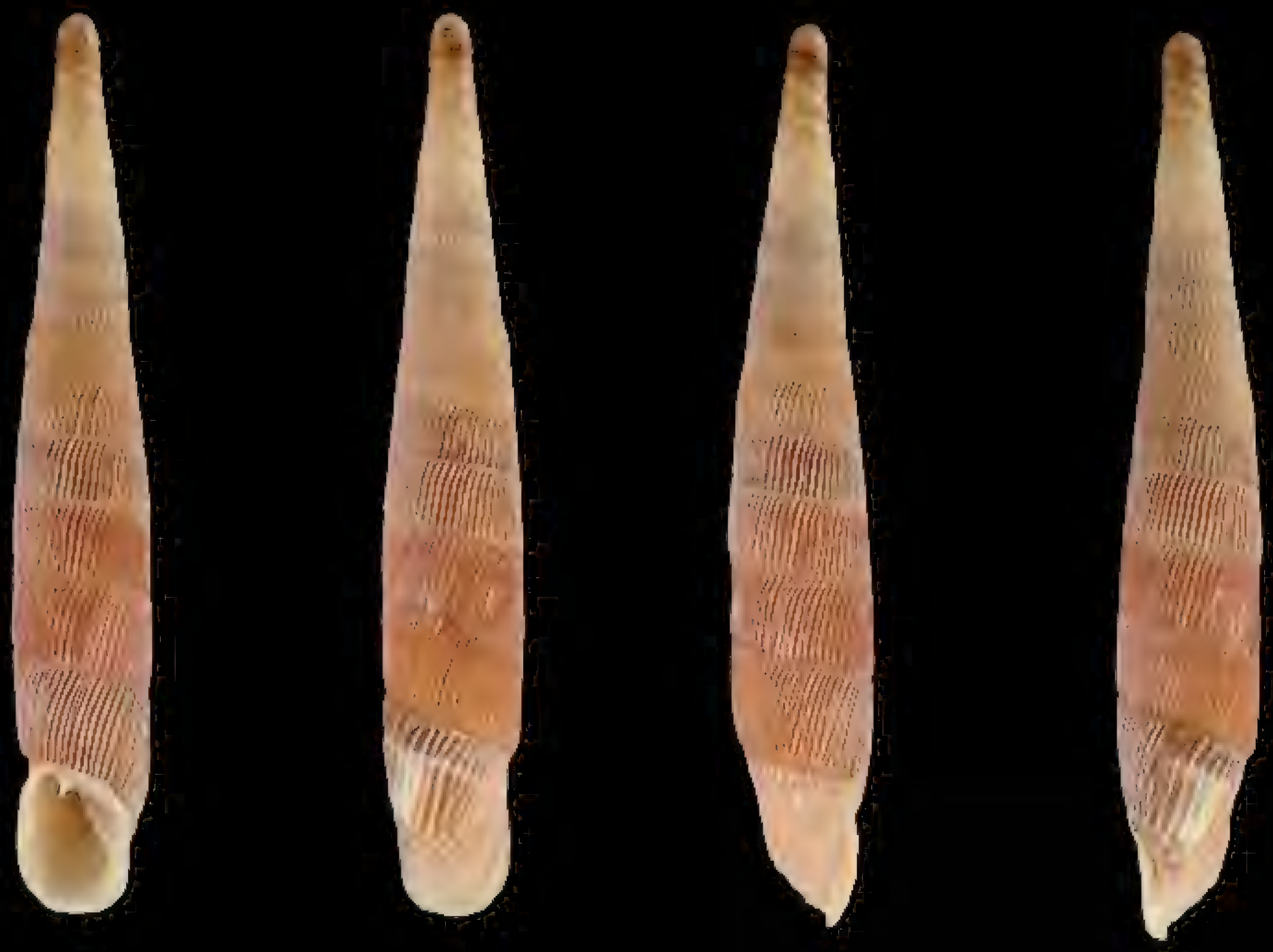
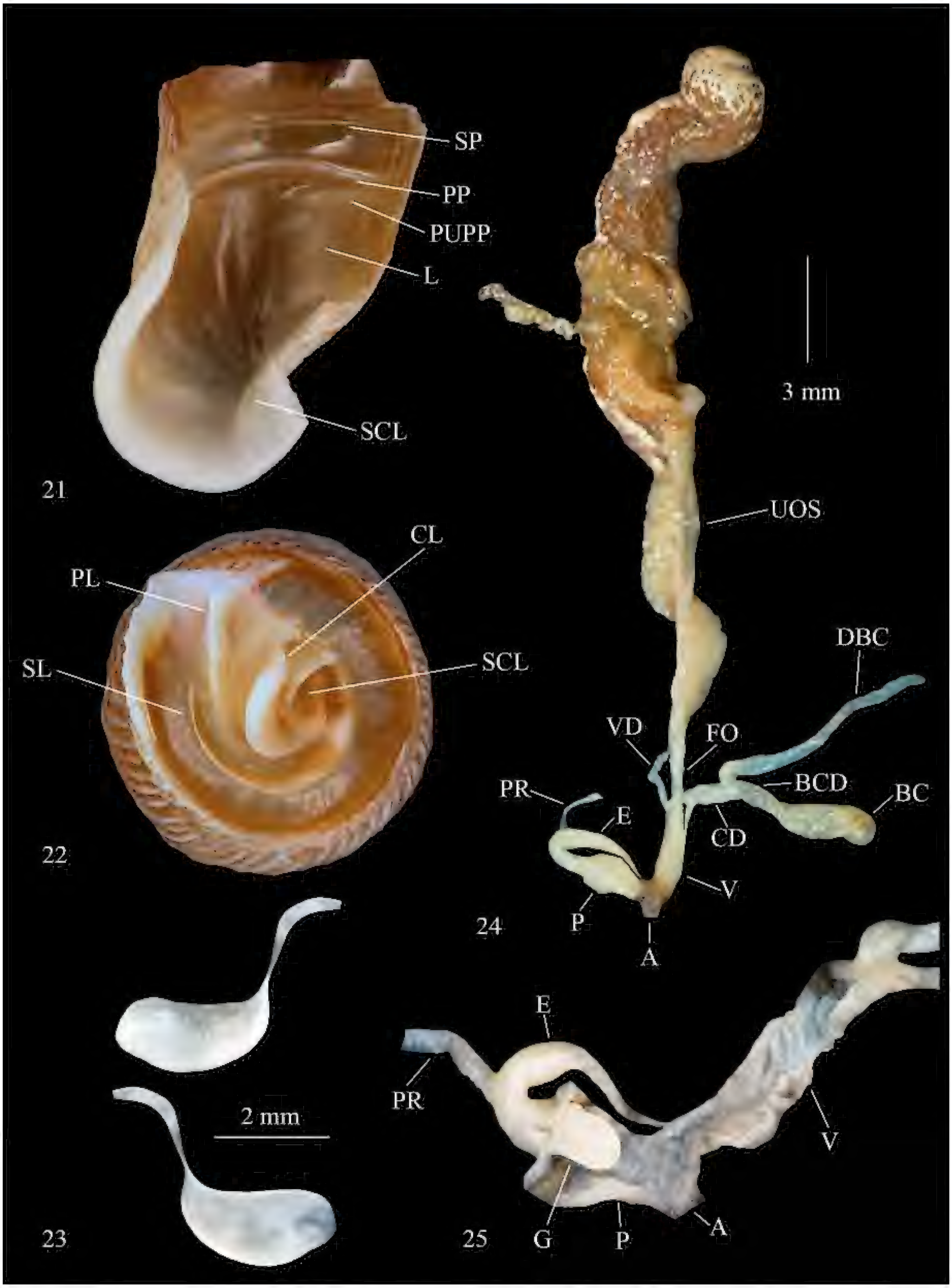


20

Figure 19. *Mauritanica tristrami zribensis* n. ssp., Tunisia, Hamman Zriba, holotype, H = 26 mm. Figure 20. Idem, paratype, H = 26.5 mm.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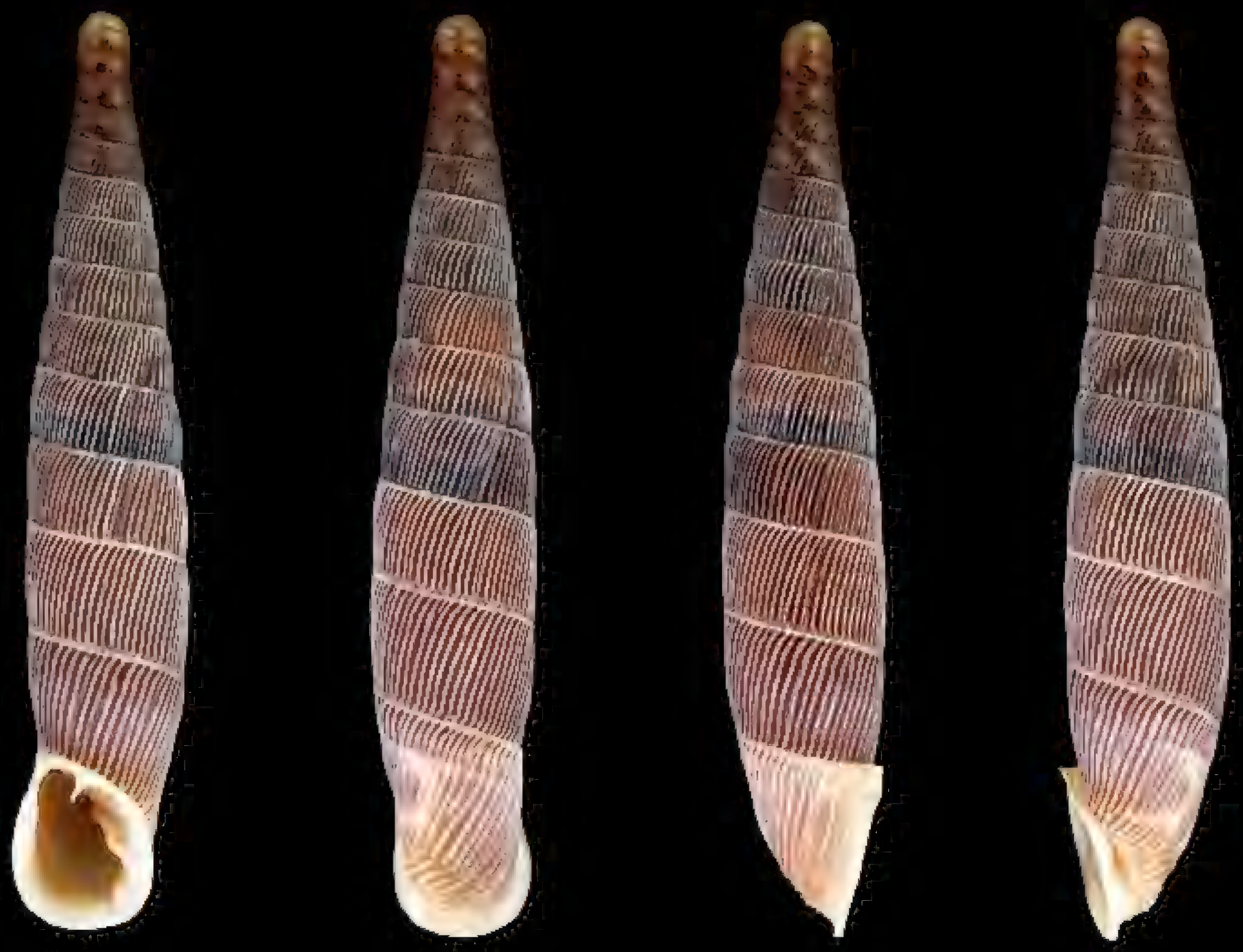
Figures 21–25. *Mauritanica tristrami zribensis* n. ssp., Tunisia, Hamman Zriba, paratype. Fig. 21: palatum. Fig. 22: parietum. Fig. 23: clausilium. Fig. 24: genitalia. Fig. 25: inner structures of the penis and vagina.



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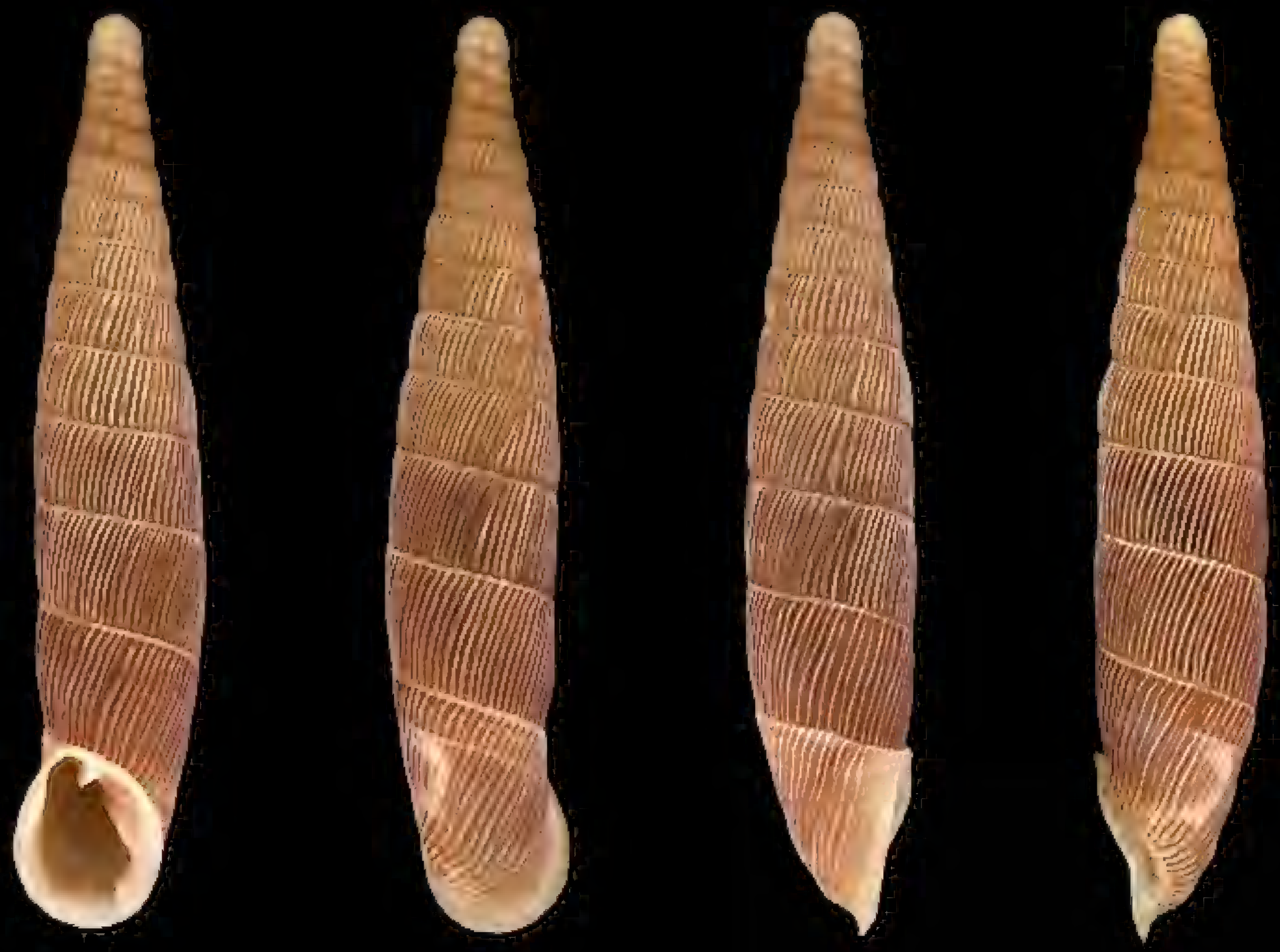
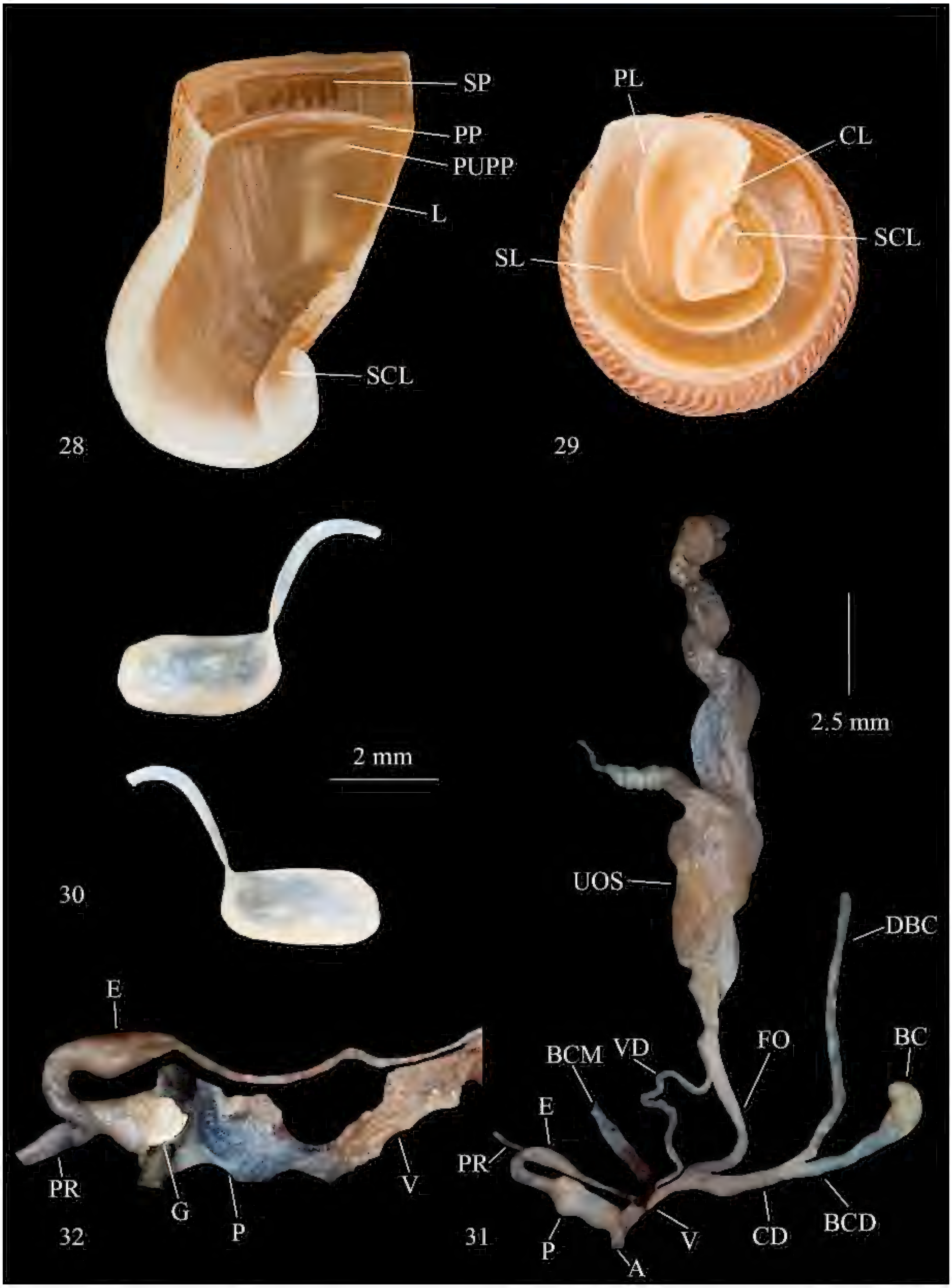


27

Figure 26. *Mauritanica tristrami nouirasaidi* n. ssp., Tunisia, Kesra, holotype, H = 21.3 mm. Figure 27. Idem, paratype, H = 22.5 mm.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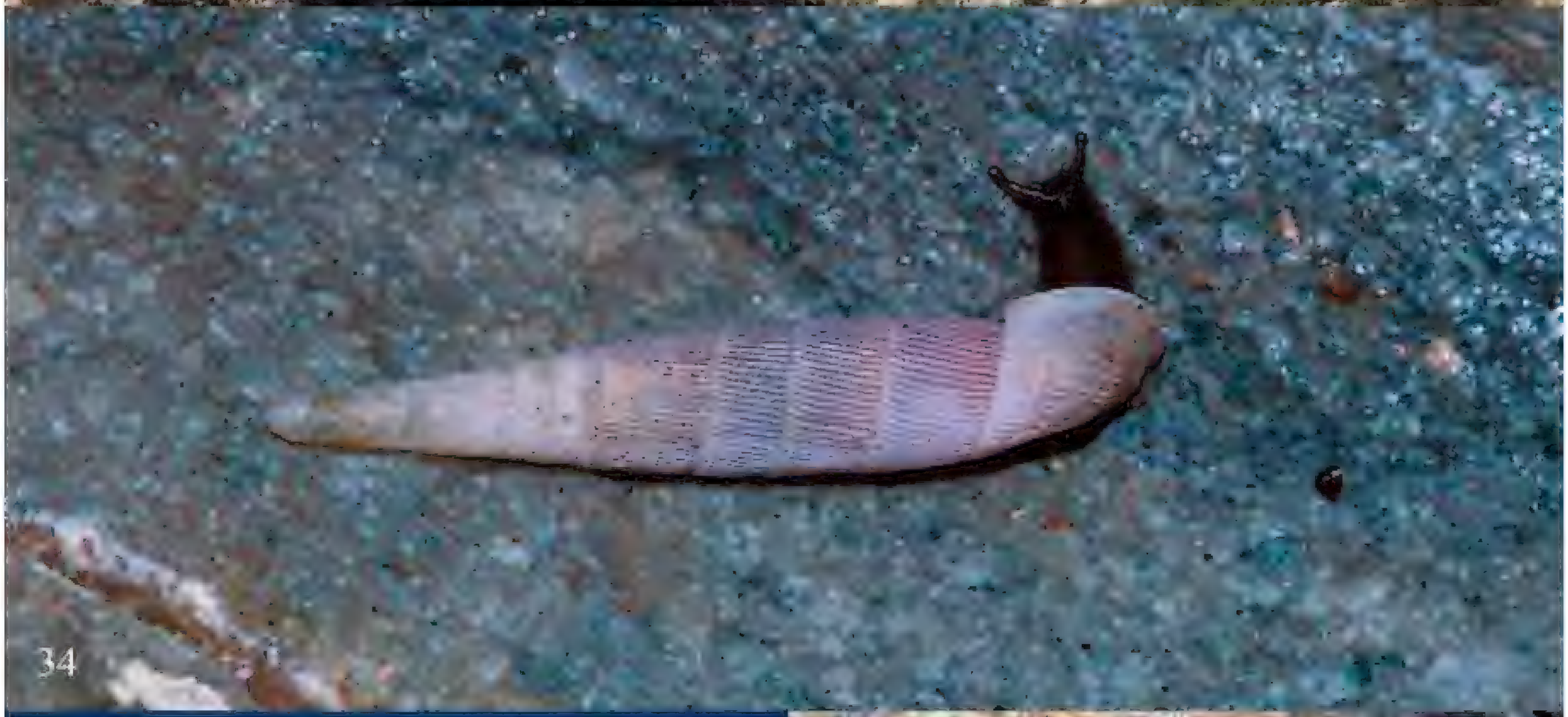
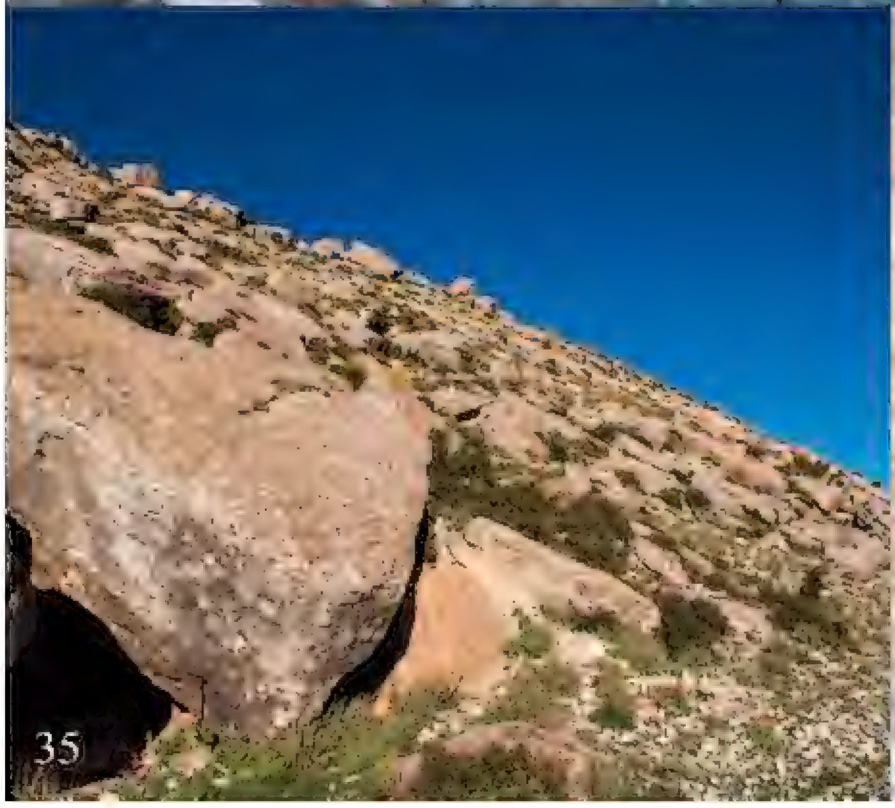
Figures 28–32. *Mauritanica tristrami nouirasaidi* n. ssp., Tunisia, Kesra, paratype. Fig. 28: palatum. Fig. 29: parietum. Fig. 30: clausilium. Fig. 31: genitalia. Fig. 32: inner structures of the penis and vagina.





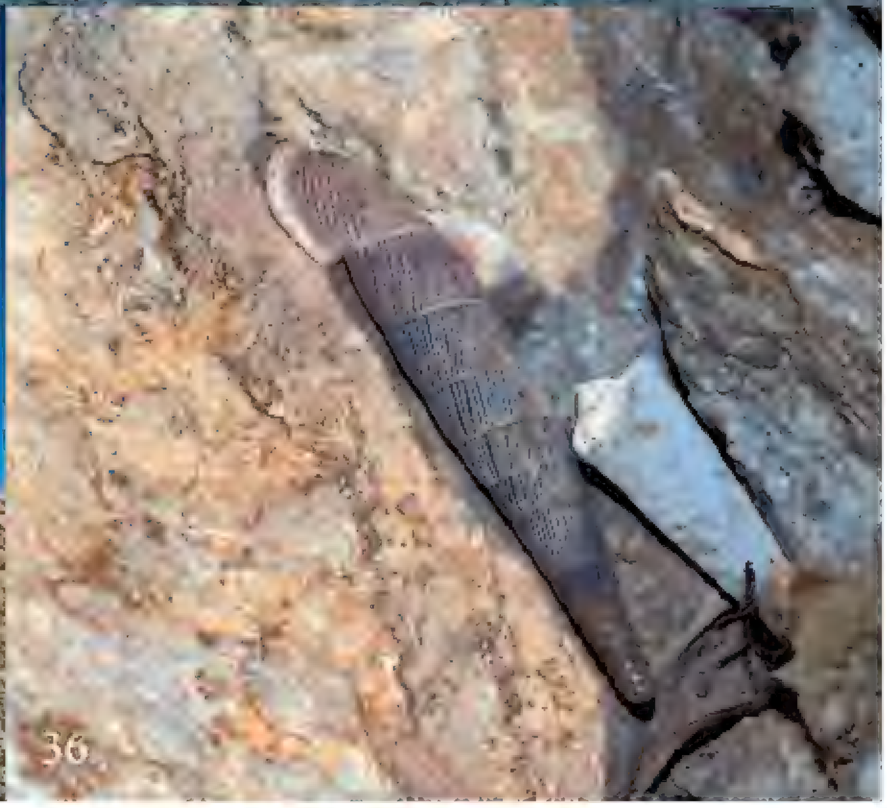
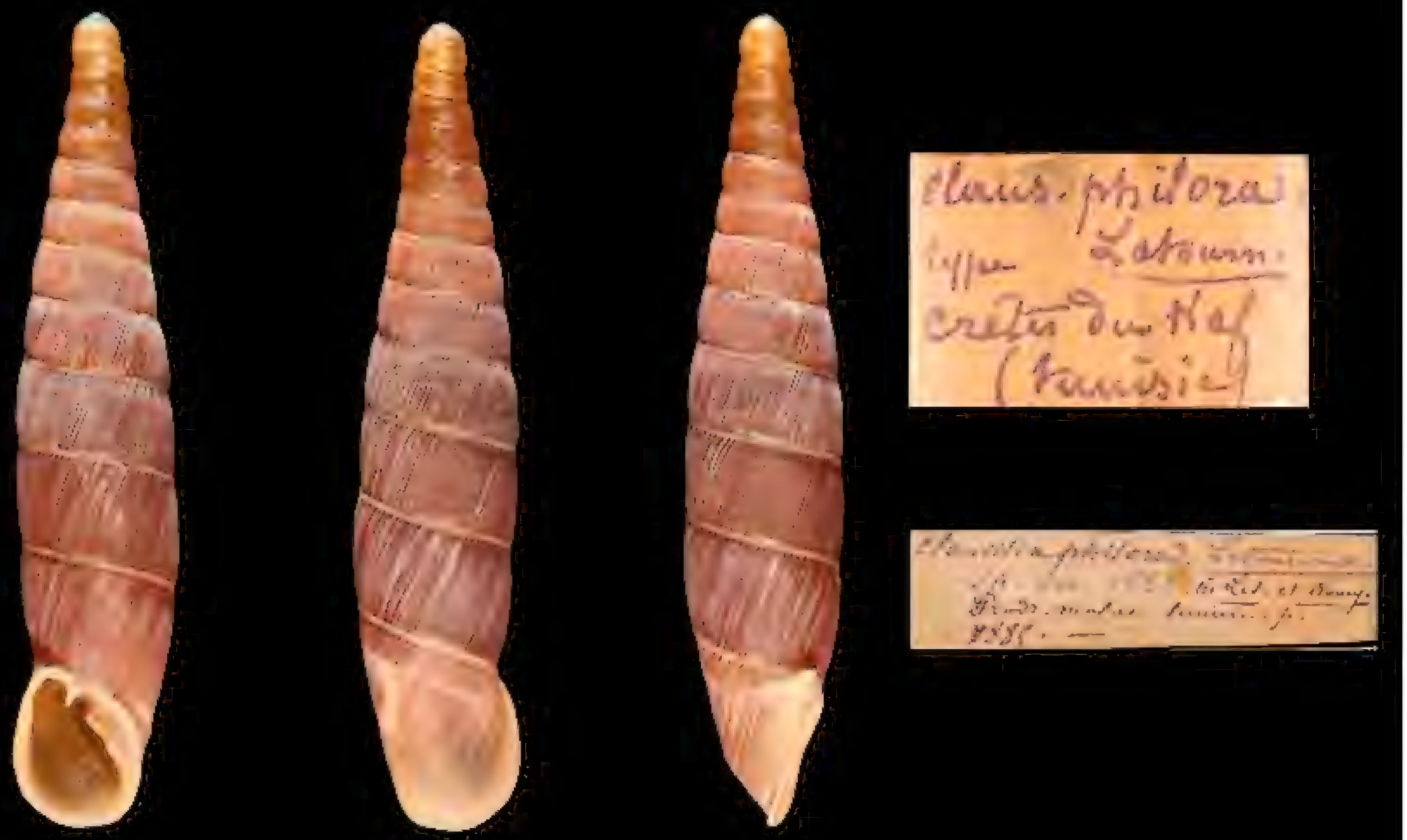


Figure 33. Tunisia, gorge near Hamman Zriba. Figure 34. *Mauritanica tristrami zribensis* n. ssp. Figure 35. Tunisia, landscape of Kesra. Figure 36. *Mauritanica tristrami nouirasaidi* n. ssp.


Claus. philora
typus Letourn.
Crêtes du Kef
(Tunisie)
Clausilia philora

37

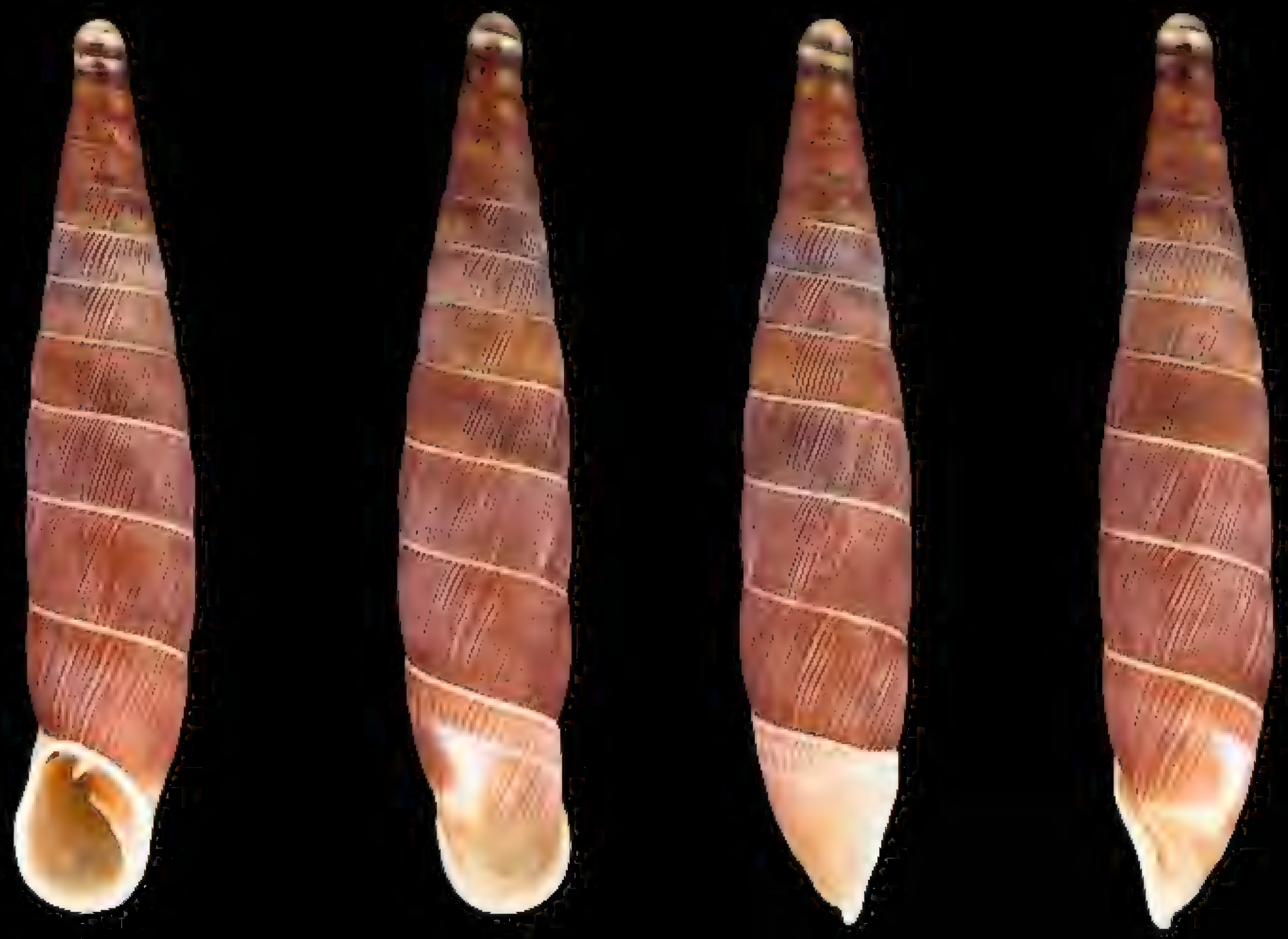


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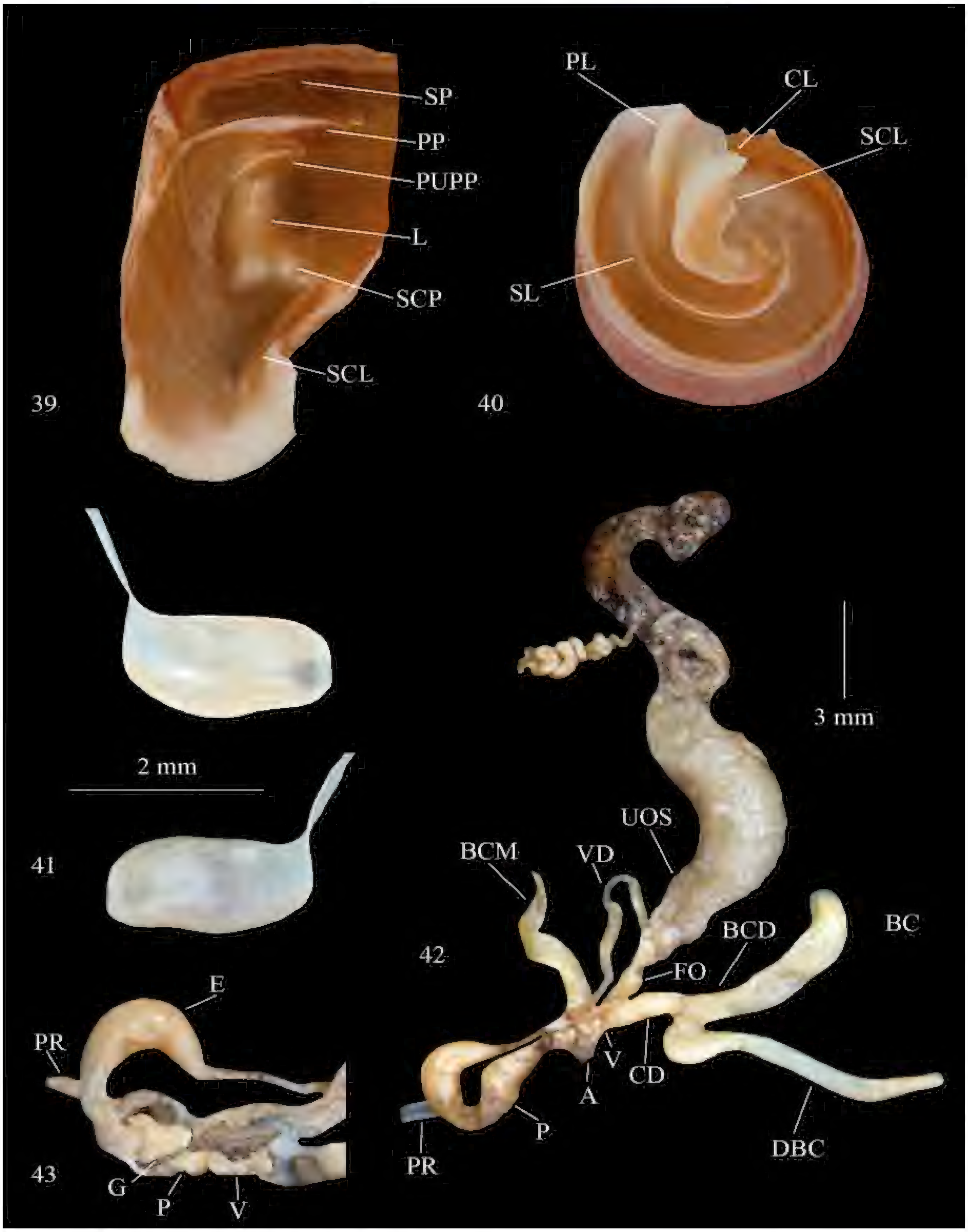
Figure 37. *Clausilia philora* Letourneux, 1887, Tunisia, El Kef, syntype with original labels. Figure 38. *Mauritanica philora philora*, Tunisia, El Kef, H = 22 mm..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Figures 39–43. *Mauritanica philora philora*, Tunisia, El Kef. Fig. 39: palatum. Fig. 40: parietum. Fig. 41: clausilium. Fig. 42: genitalia. Fig. 43: inner structures of the penis and vagina.

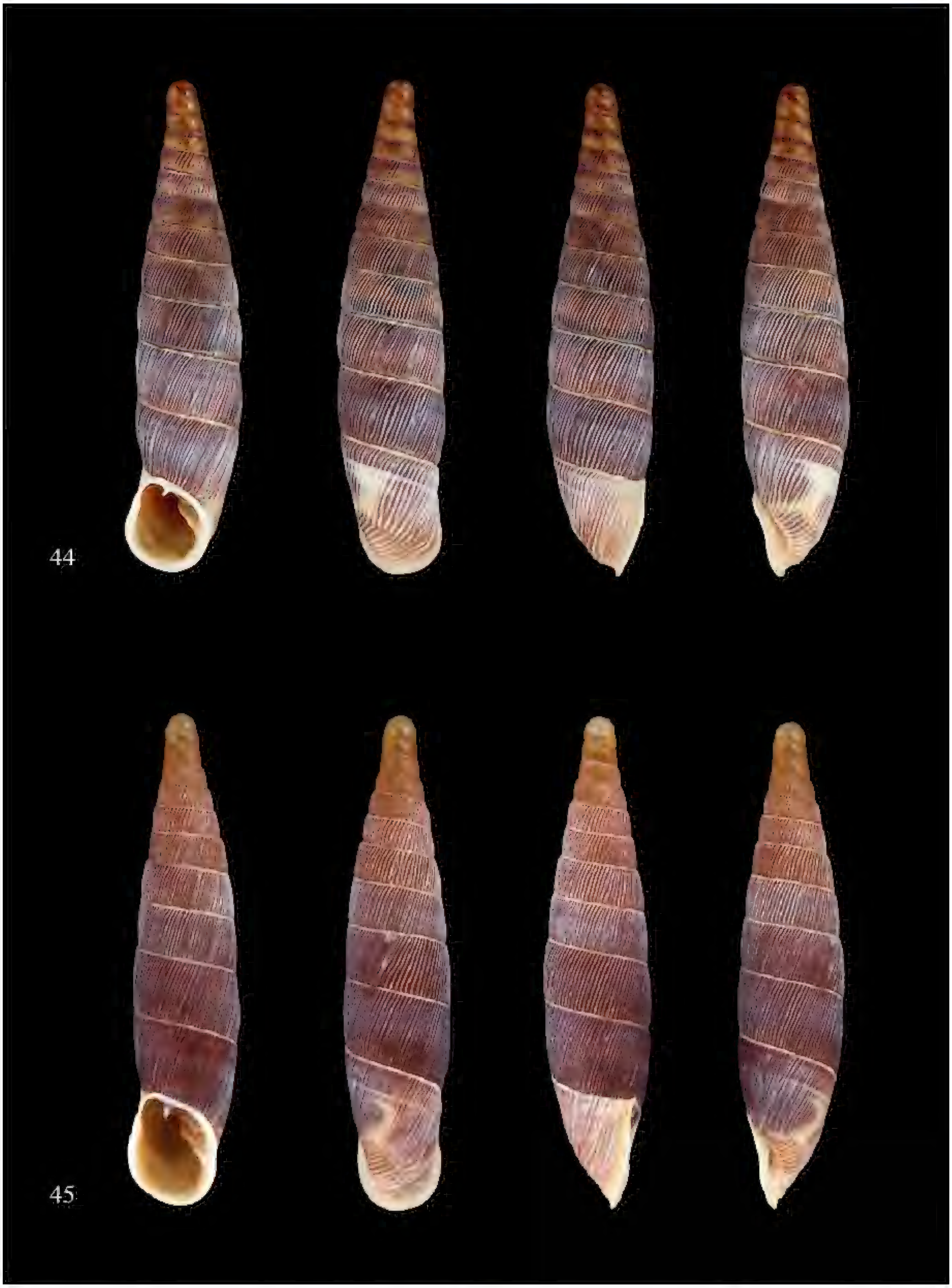
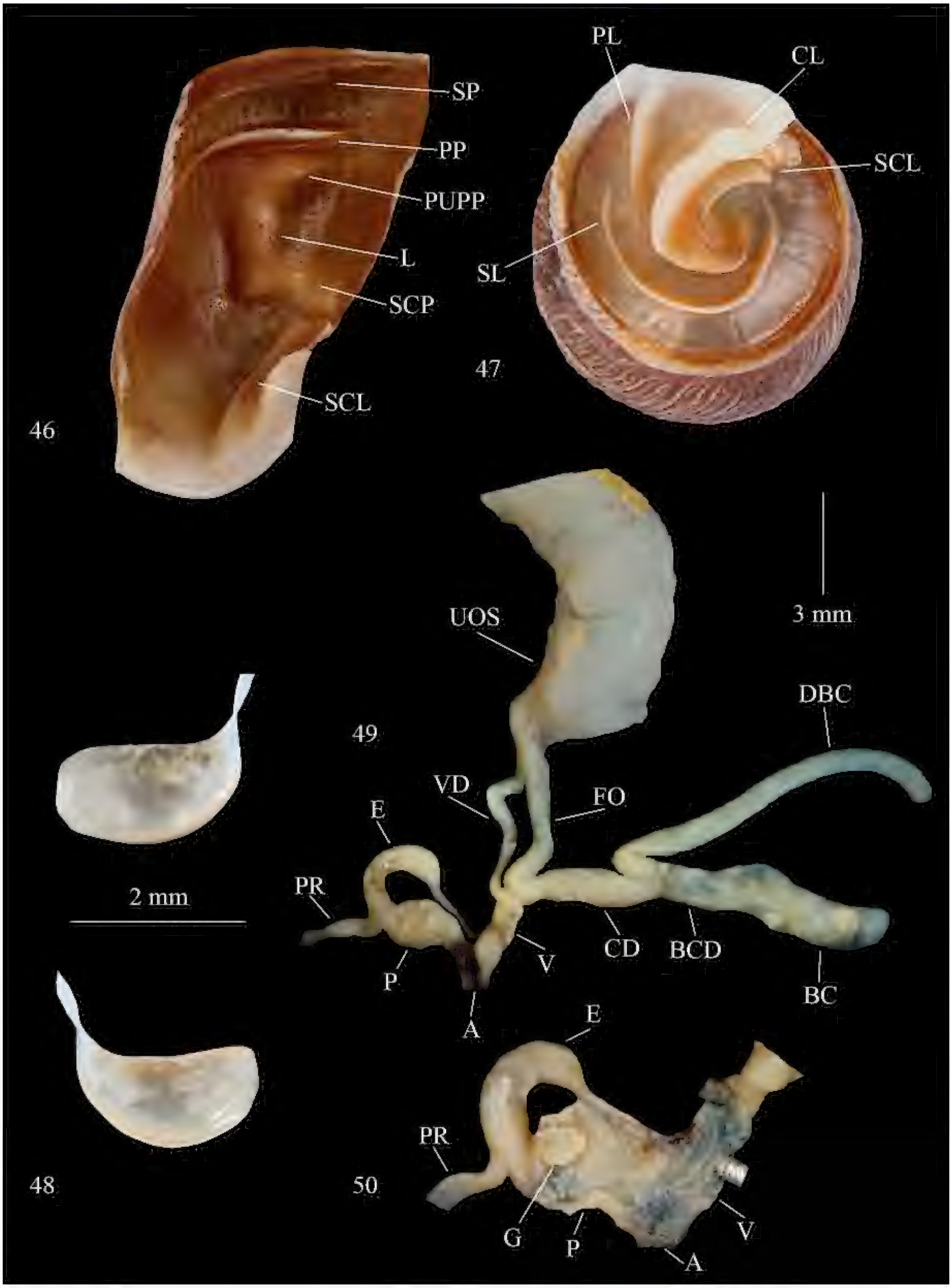


Figure 44. *Mauritanica philora bognanni* n. ssp., Tunisia, Teboursouk: Dougga, holotype, H = 21.5 mm. Figure 45. Idem, paratype, Djebba, H = 20.4 mm.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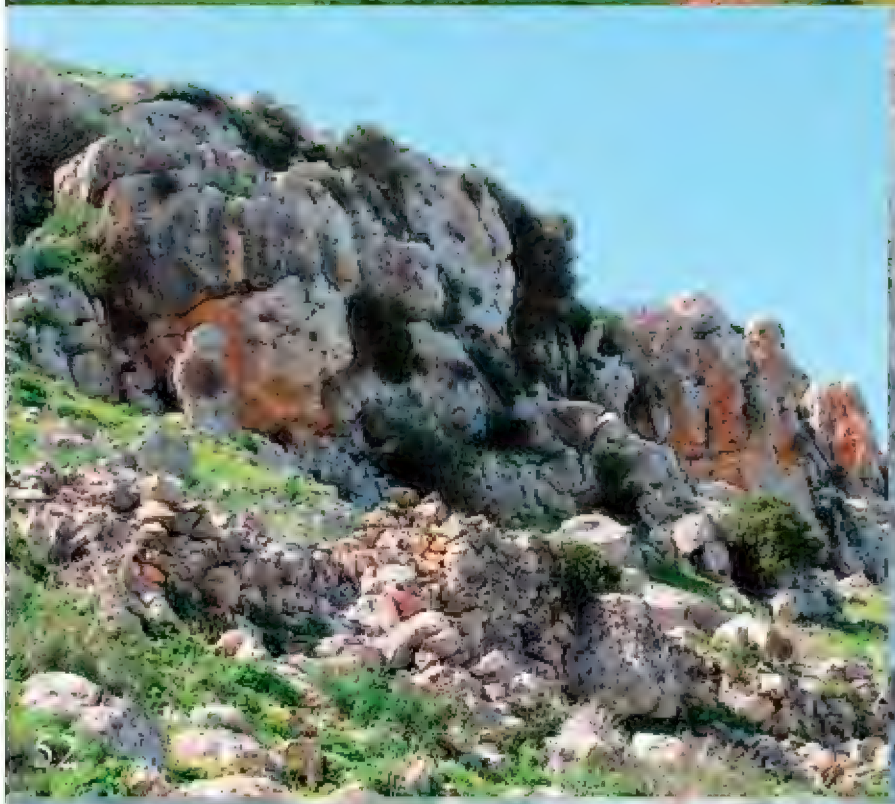
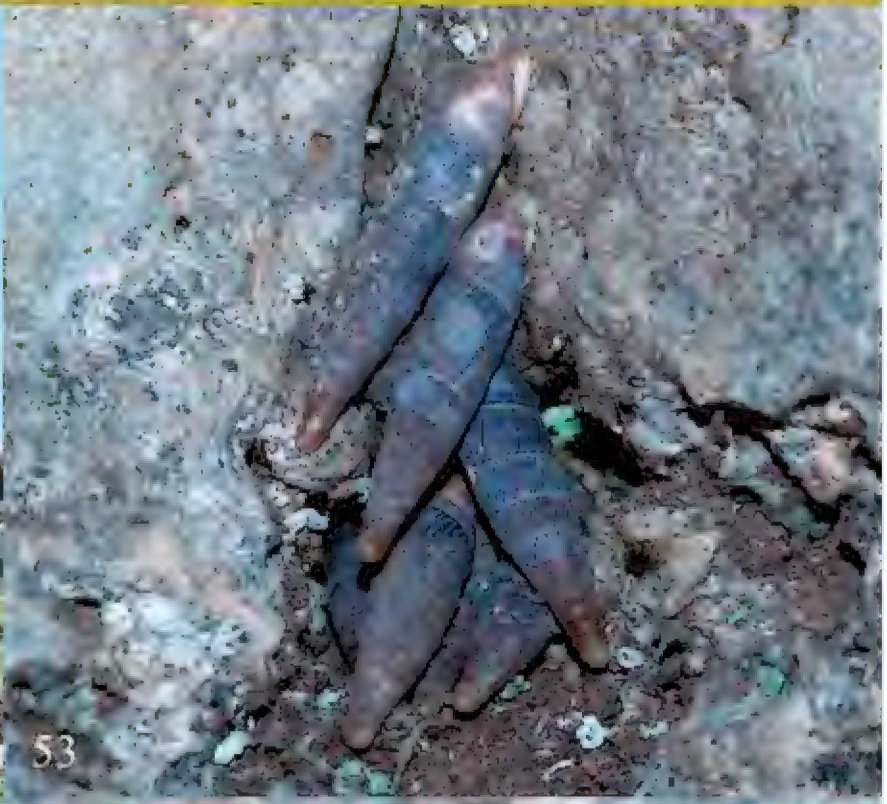
Figures 46–50. *Mauritanica philora bognannii* n. ssp. from Tunisia, Teboursouk: Dougga, paratype. Fig. 46: palatum. Fig. 47: parietum. Fig. 48: clausilium. Fig. 49: genitalia. Fig. 50: inner structures of the penis and vagina.





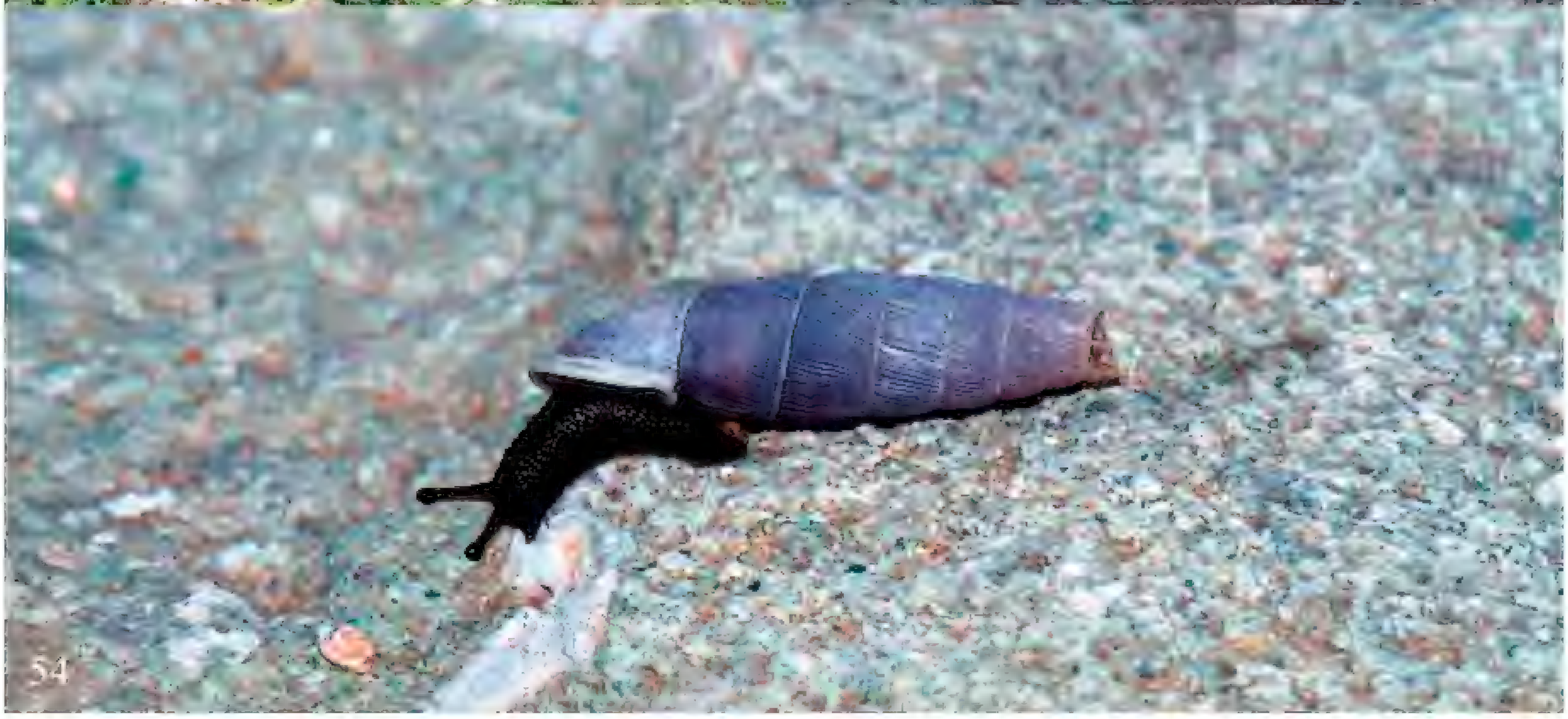
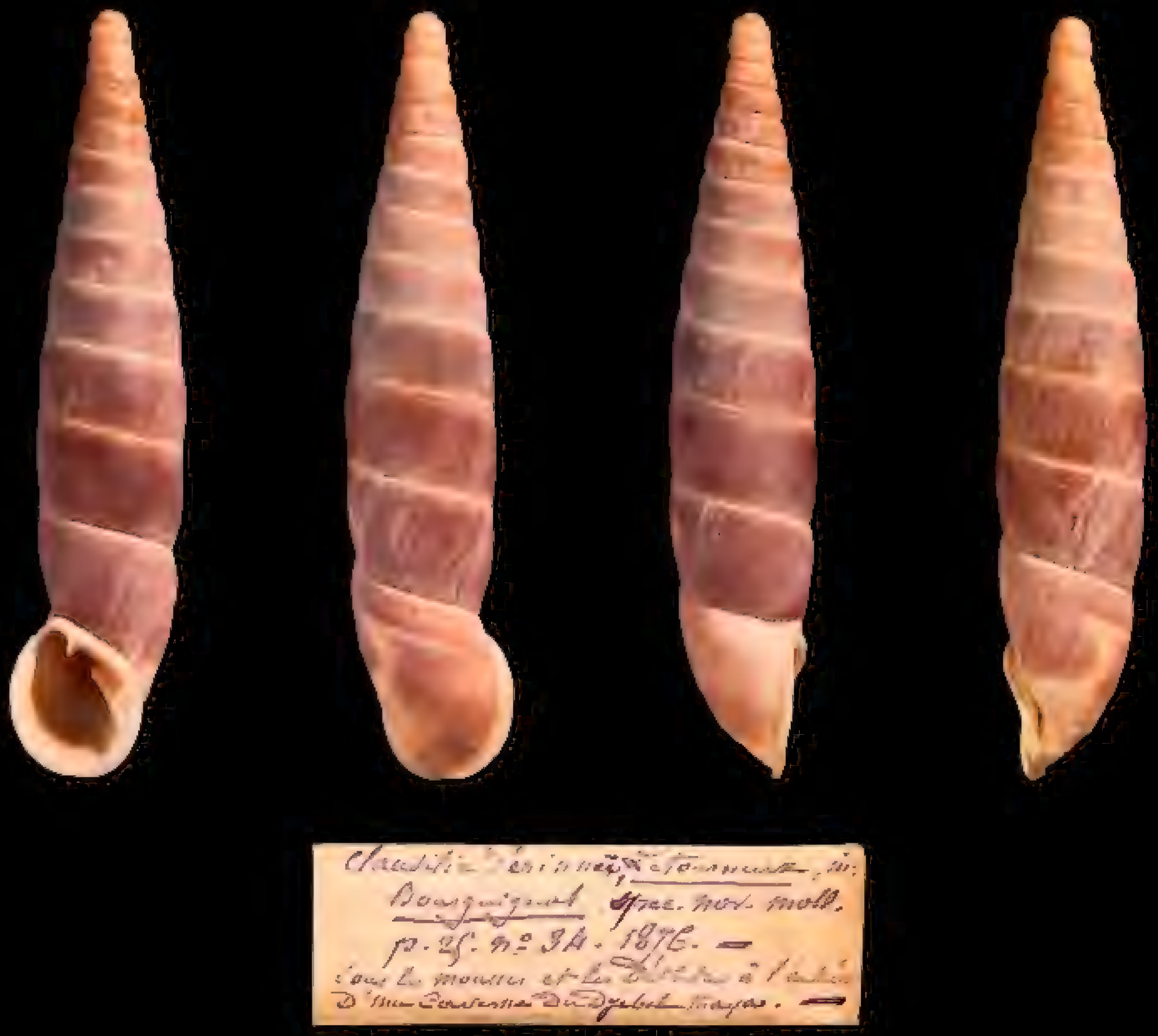


Figure 51. Tunisia, El Kef ("*Crêtes du Kef*", see text). Figure 52. Tunisia, Teboursouk, Dougga. Figures 53, 54. *Mauritanica philora bognanni* n. ssp.



Clausilia Perinnei, Letourneux, in: Bourguignat Spec. nov. moll. p. 25. n° 34. 1876. —
sous les mousses et les détritus à l'abri d'une caverne du Djebel Thaya. —

55

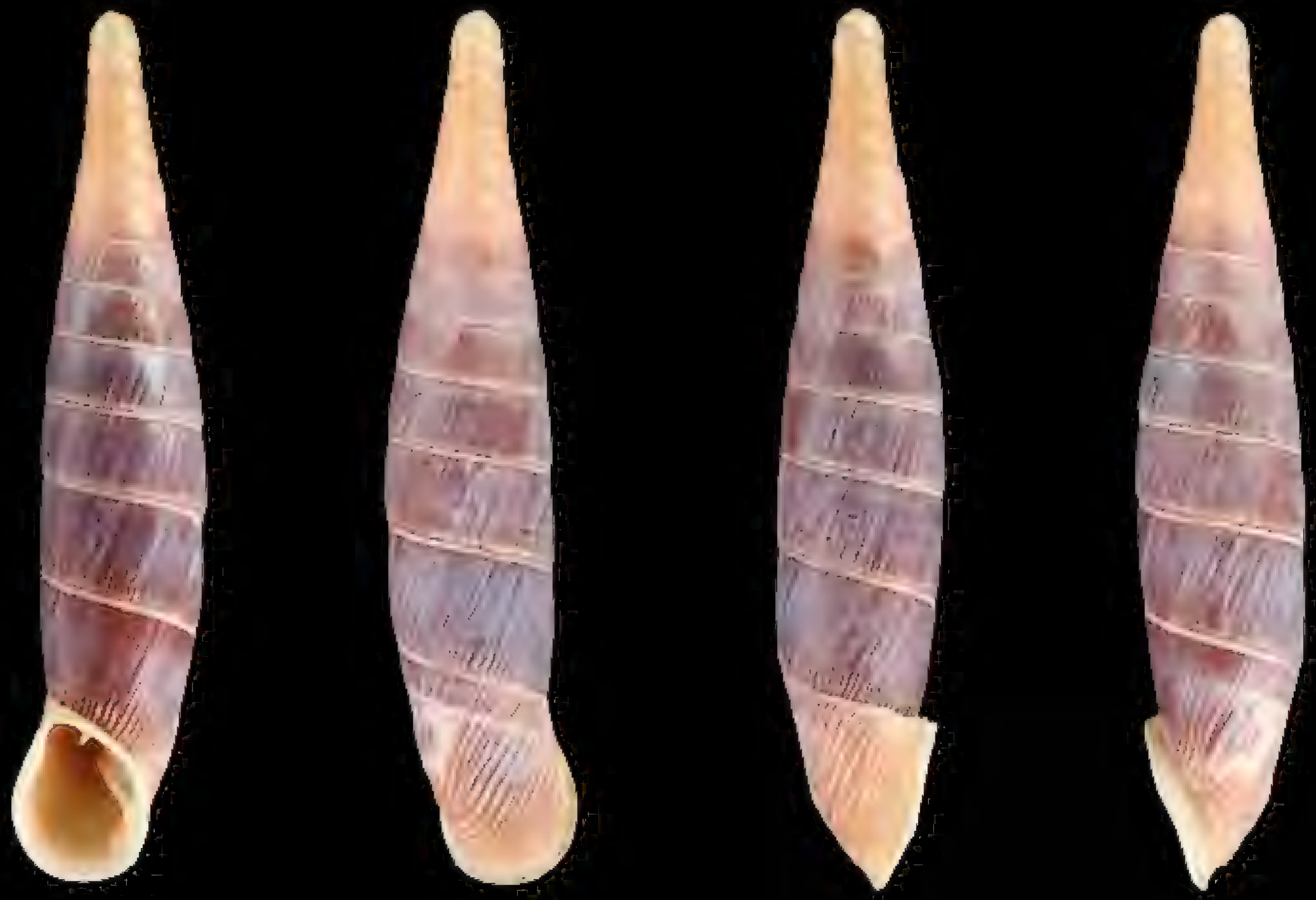


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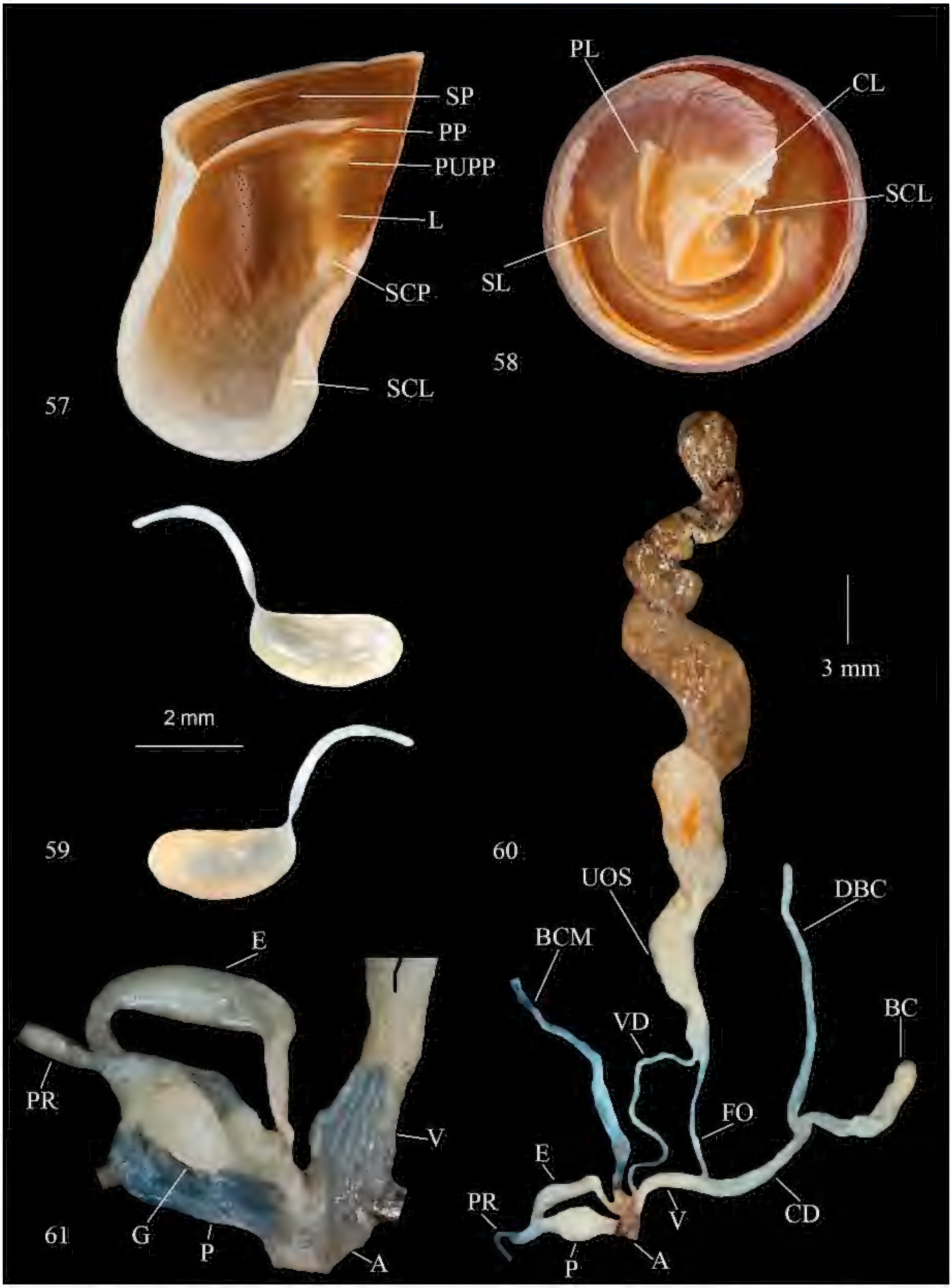
Figure 55. *Clausilia perinnei* Letourneux, 1876, Algeria, Djebel Thaya, syntype with original label, H = 24 mm. Figure 56. *Mauritanica perinni polygyra*,Tunisia, Djebel Zaghouan, H = 26.8 mm.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A

Figures 57–61. *Mauritanica perinni polygyra*, Tunisia, Djebel Zaghouan. Fig. 57: palatum. Fig. 58: parietum. Fig. 59: clausilium. Fig. 60: genitalia. Fig. 61: inner structures of the penis and vagina.

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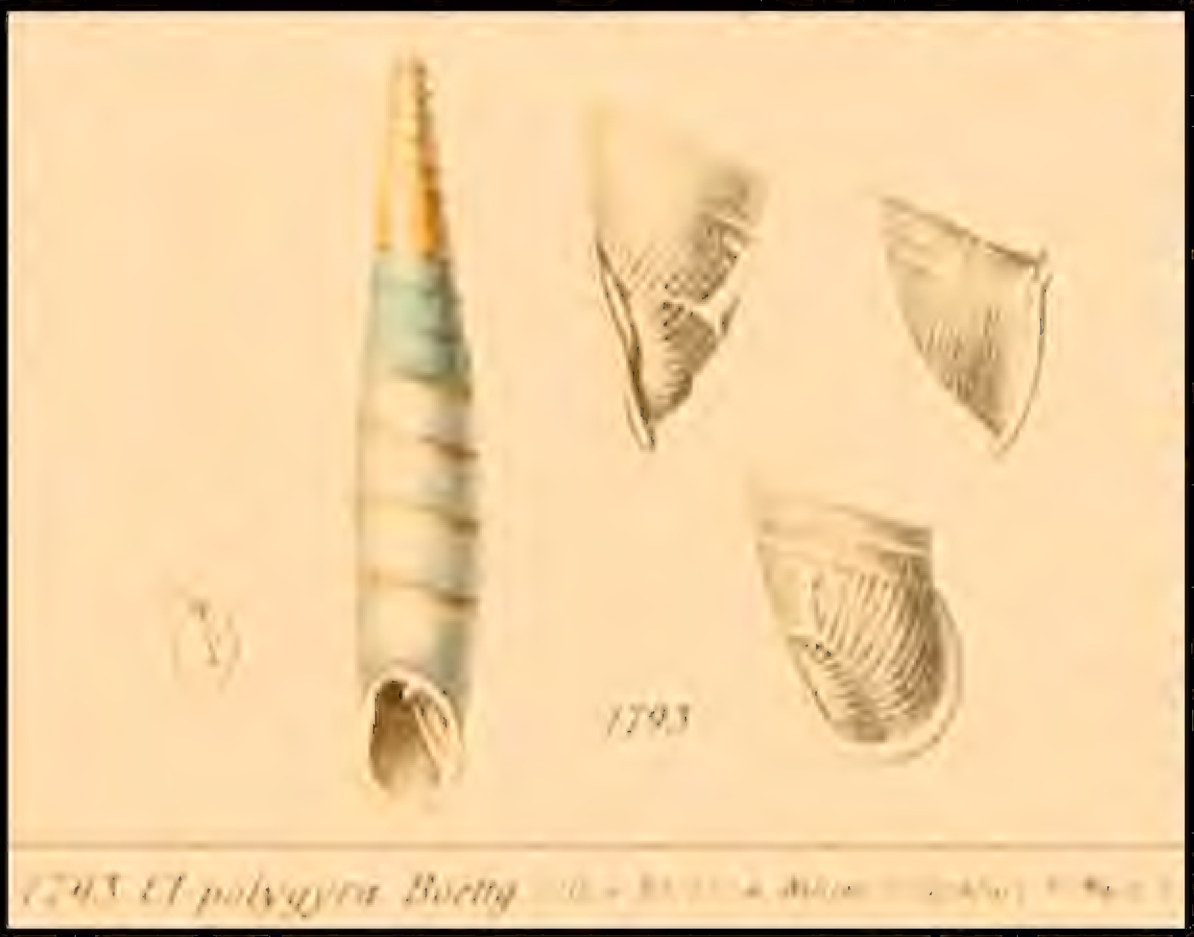
1793
1793. Cl. polygyra Boettg.

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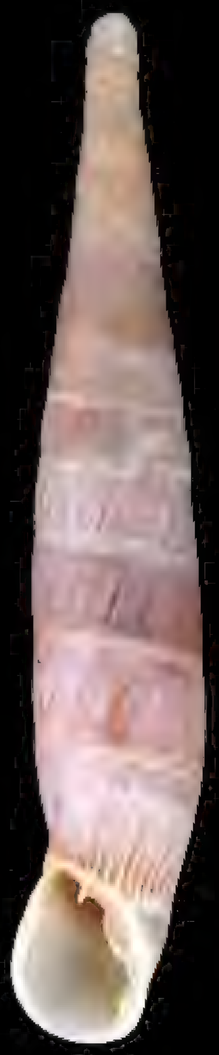

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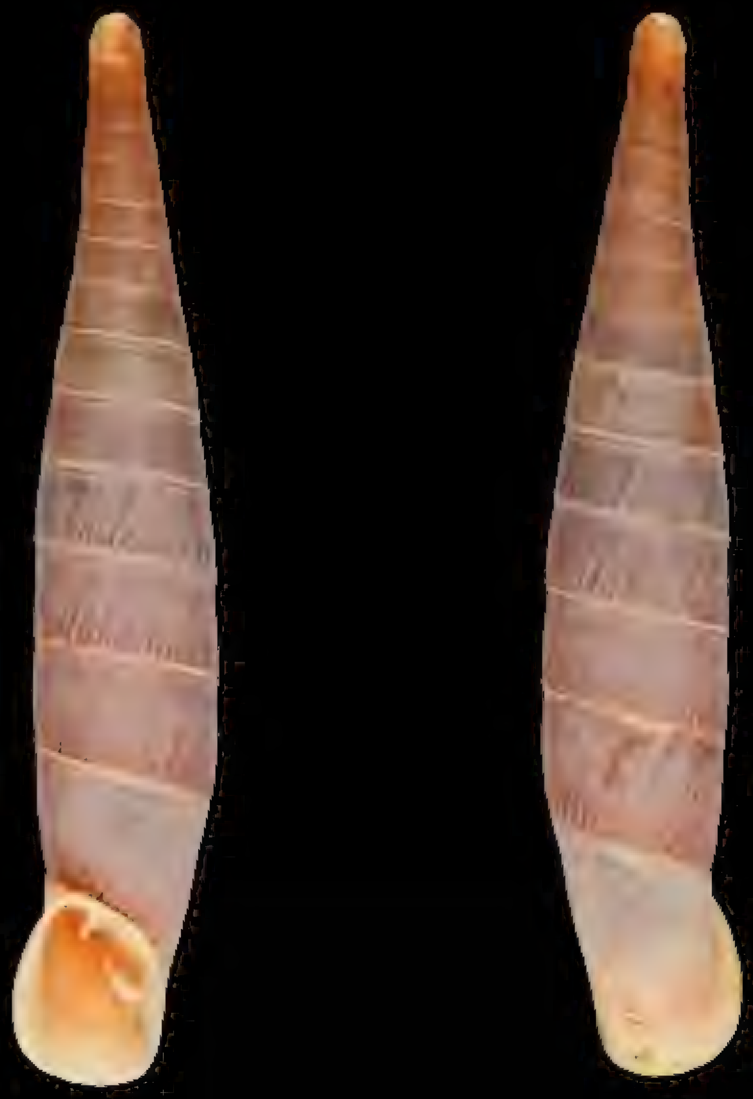

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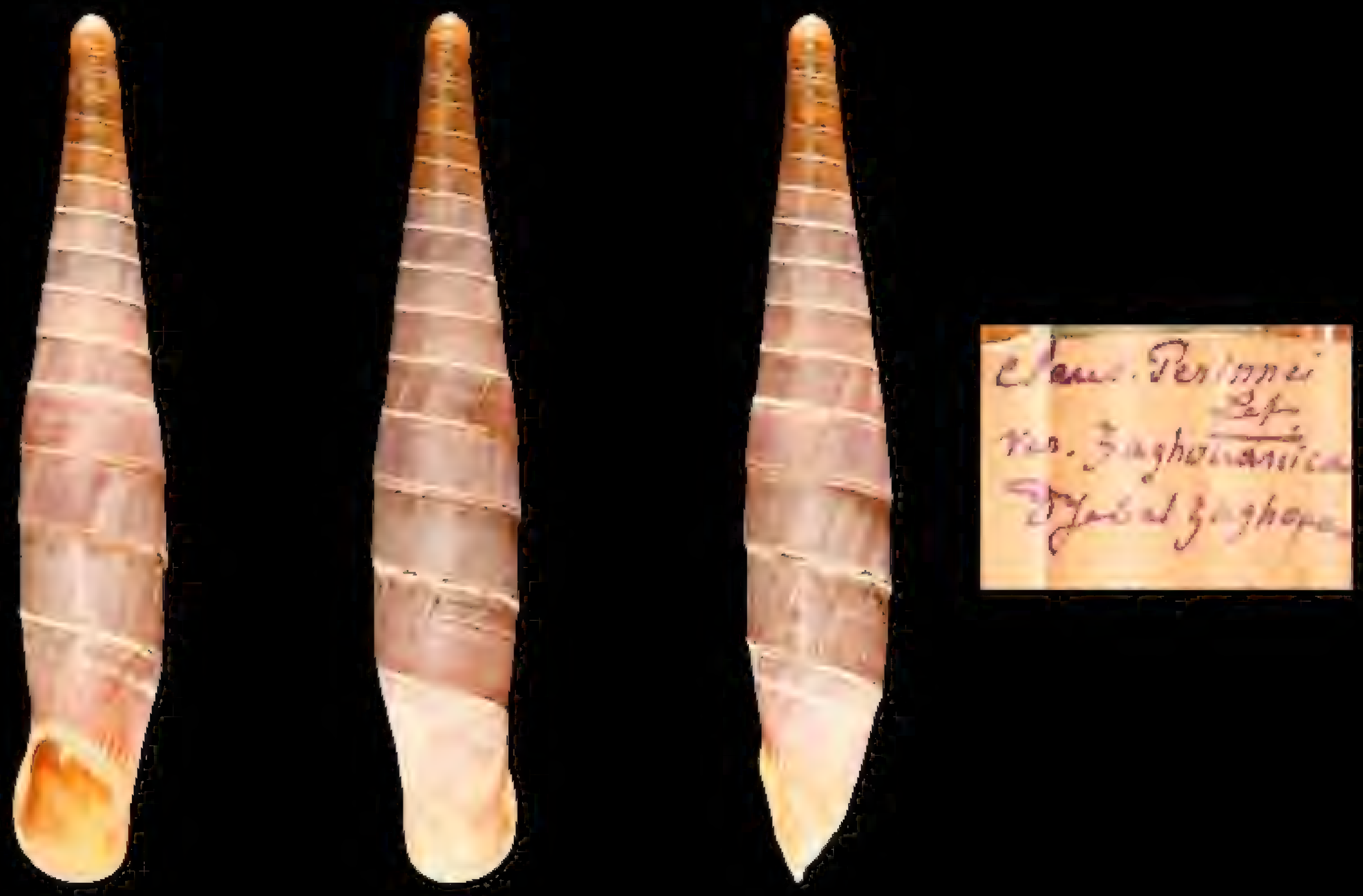
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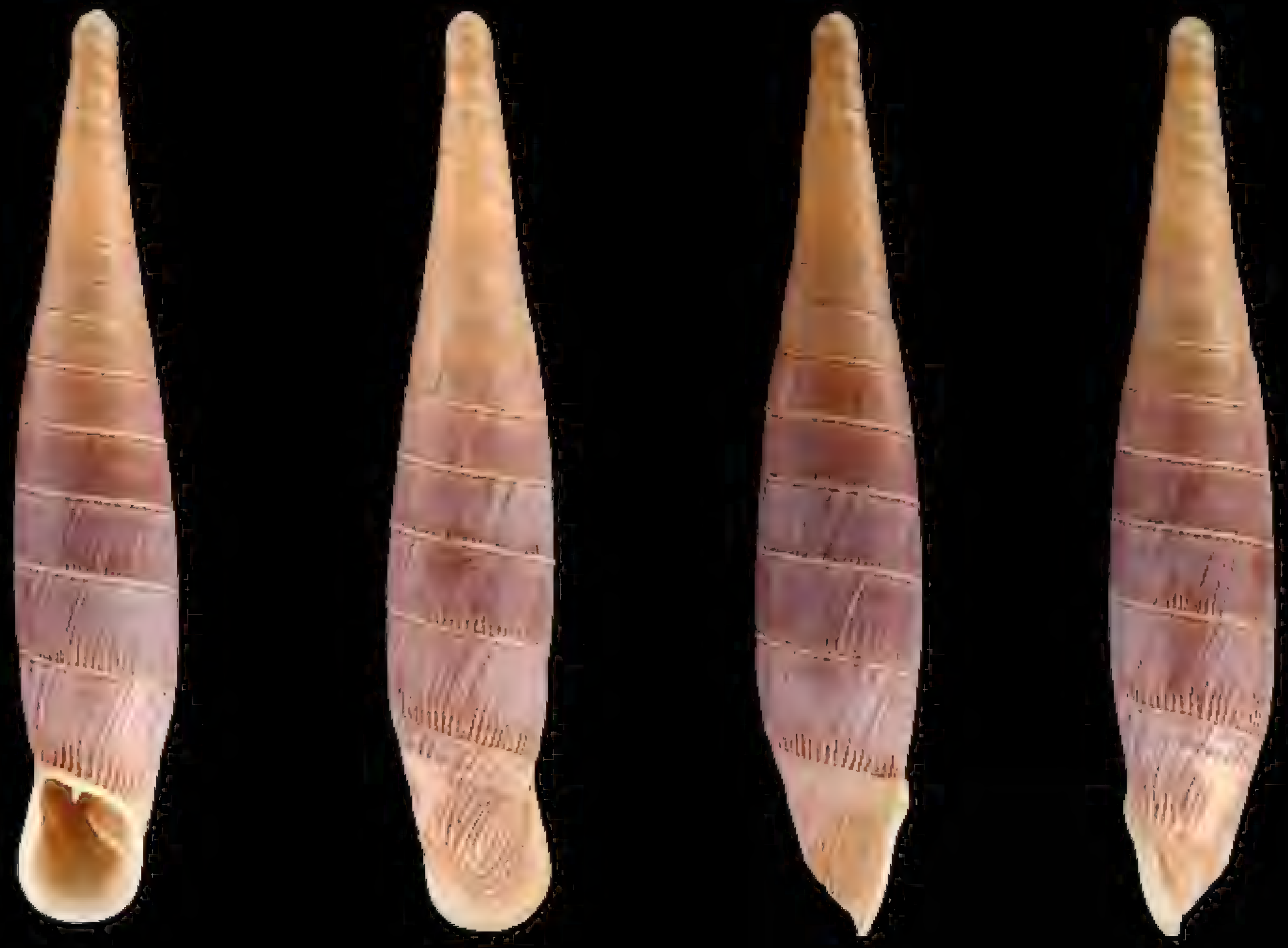
Let
var. Zaghouanica
Djebel Zaghoua

65



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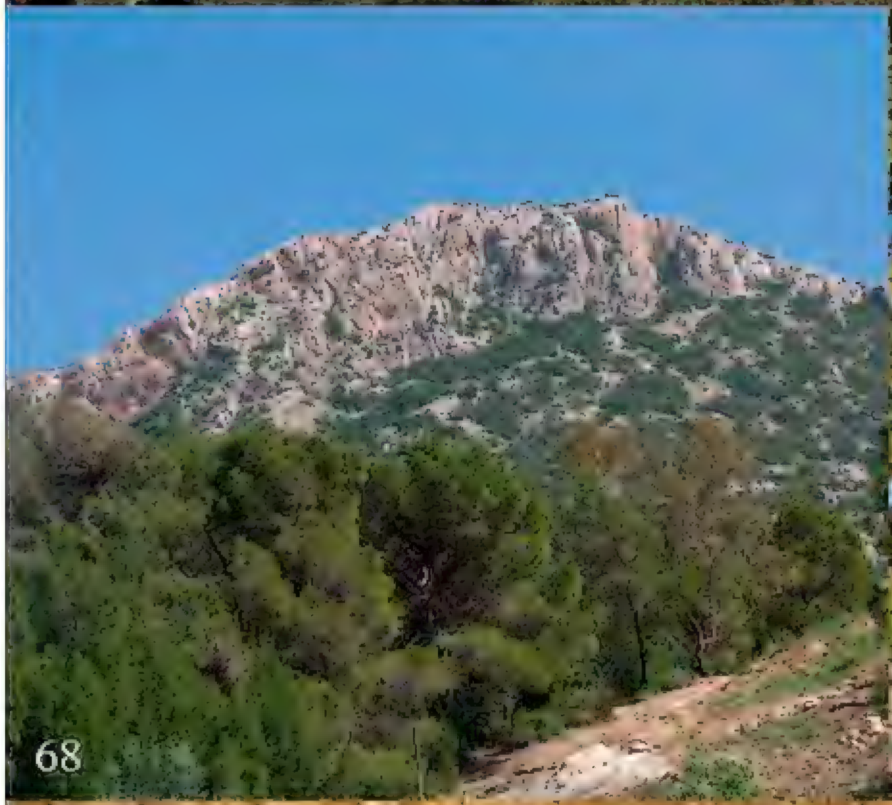

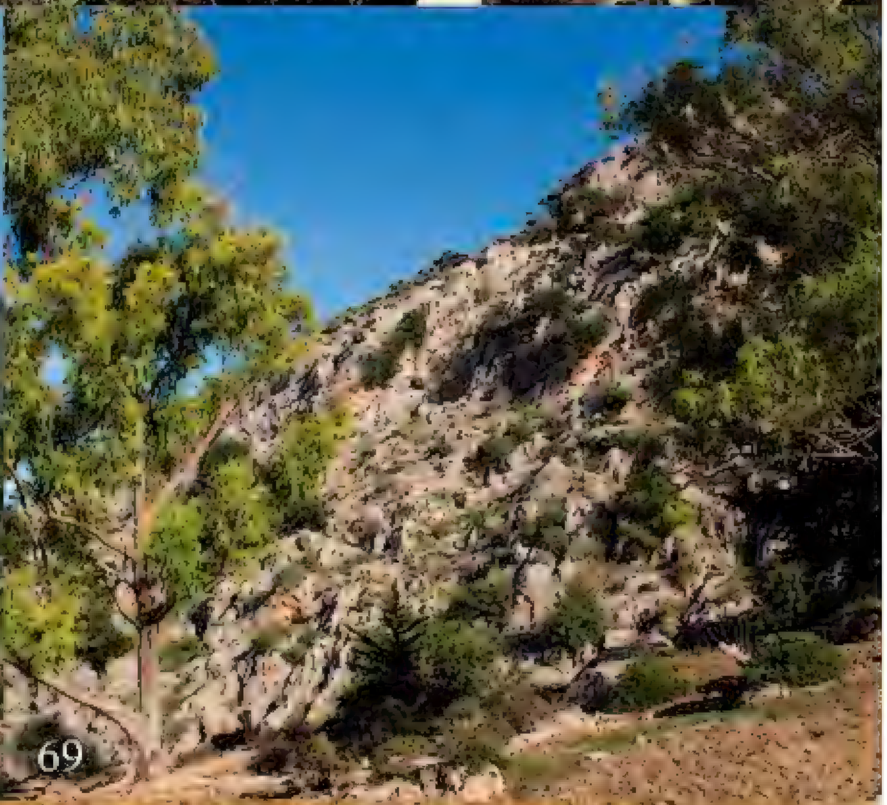

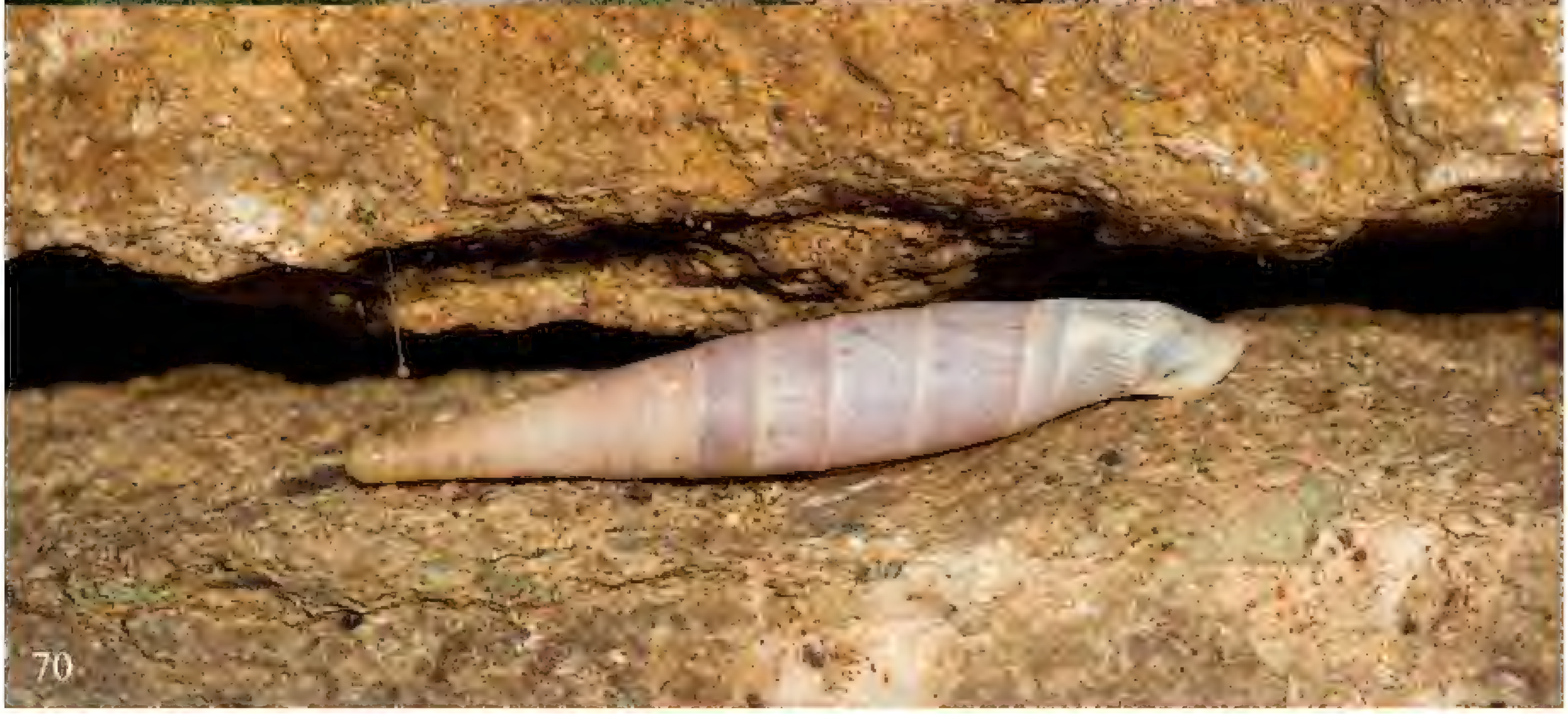

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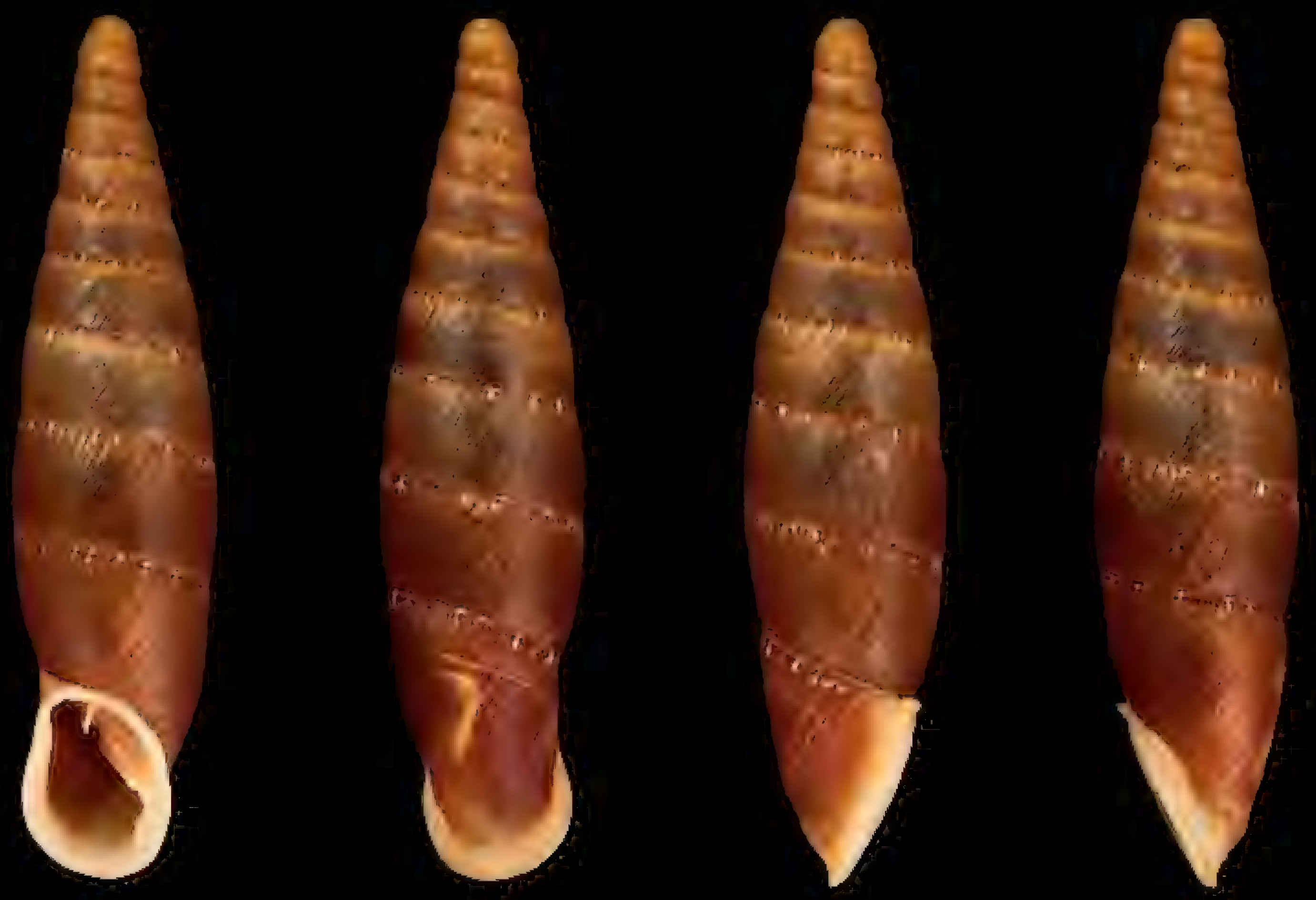

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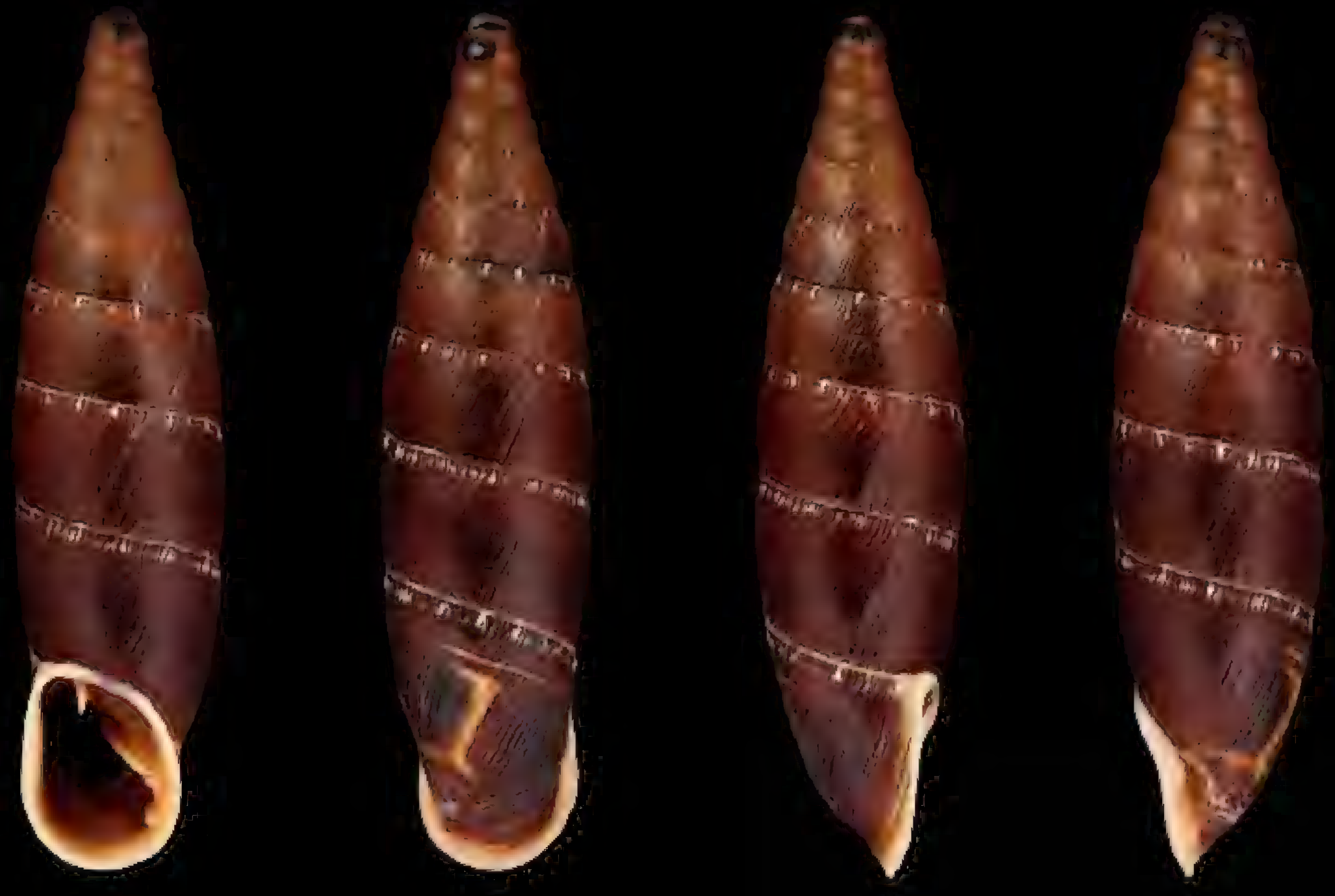
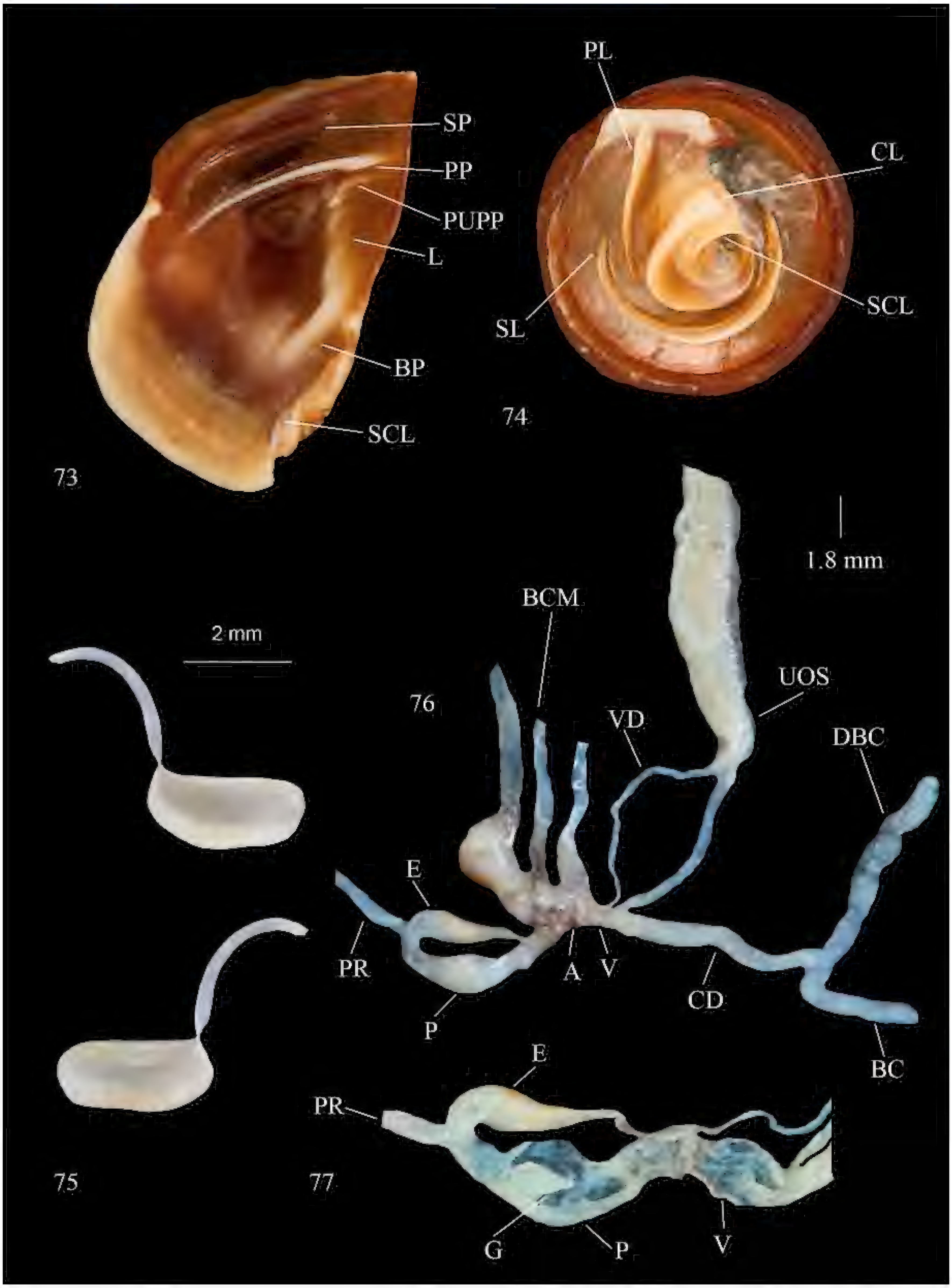


Figure 71. *Mauritanica cossonii*, Tunisia, Capo Bon, Al Huwariyah, H = 17.6 mm.
Figure 72. *Mauritanica cossonii*, Tunisia, Capo Bon, Al Huwariyah, H = 18.2 mm.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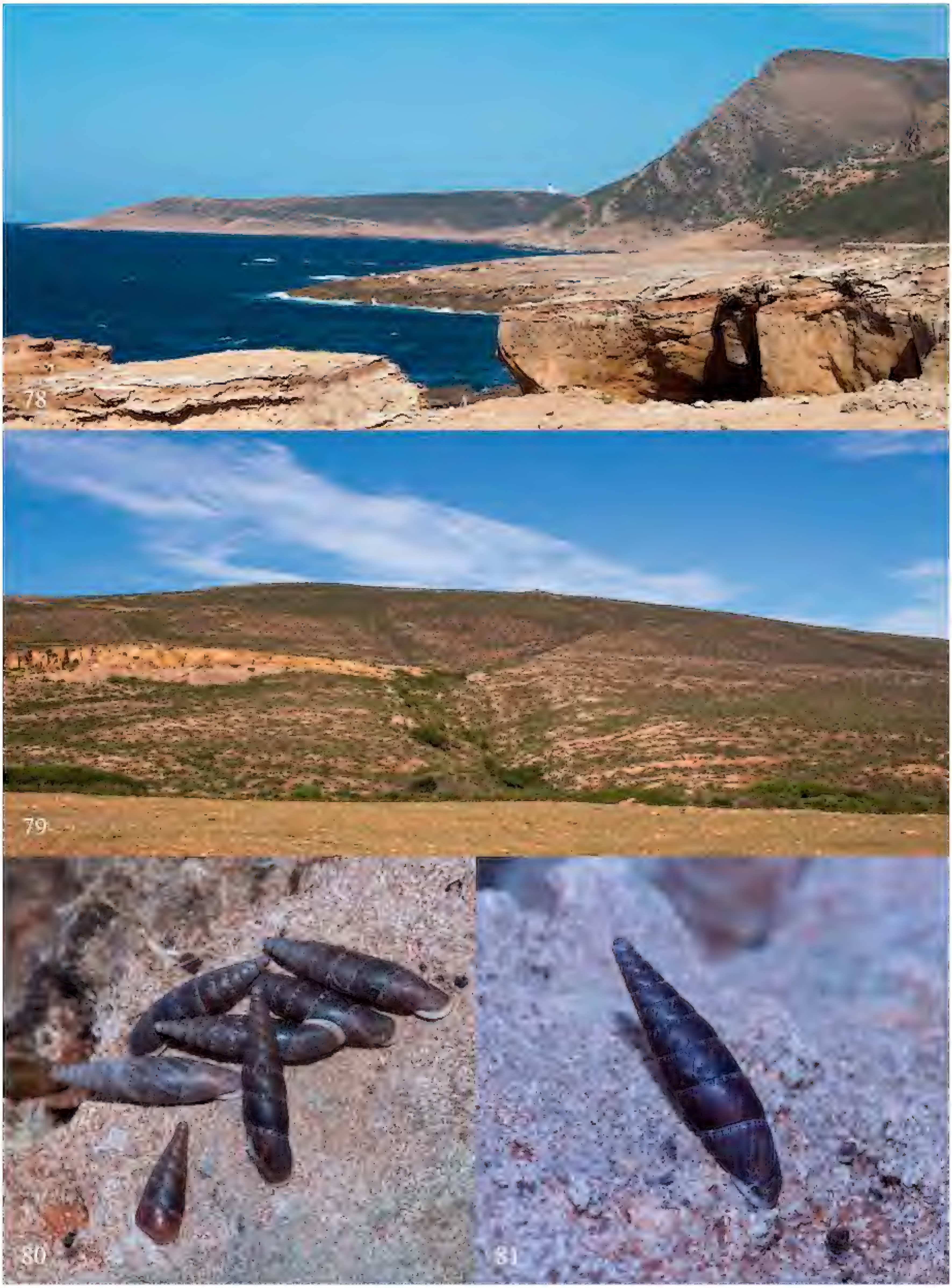
Figures 73–77. *Mauritanica cossonii* from Tunisia, Capo Bon, Al Huwariyah. Fig. 73: palatum. Fig. 74: parietum. Fig. 75: clausilium. Fig. 76: genitalia. Fig. 77: inner structures of the penis and vagina.



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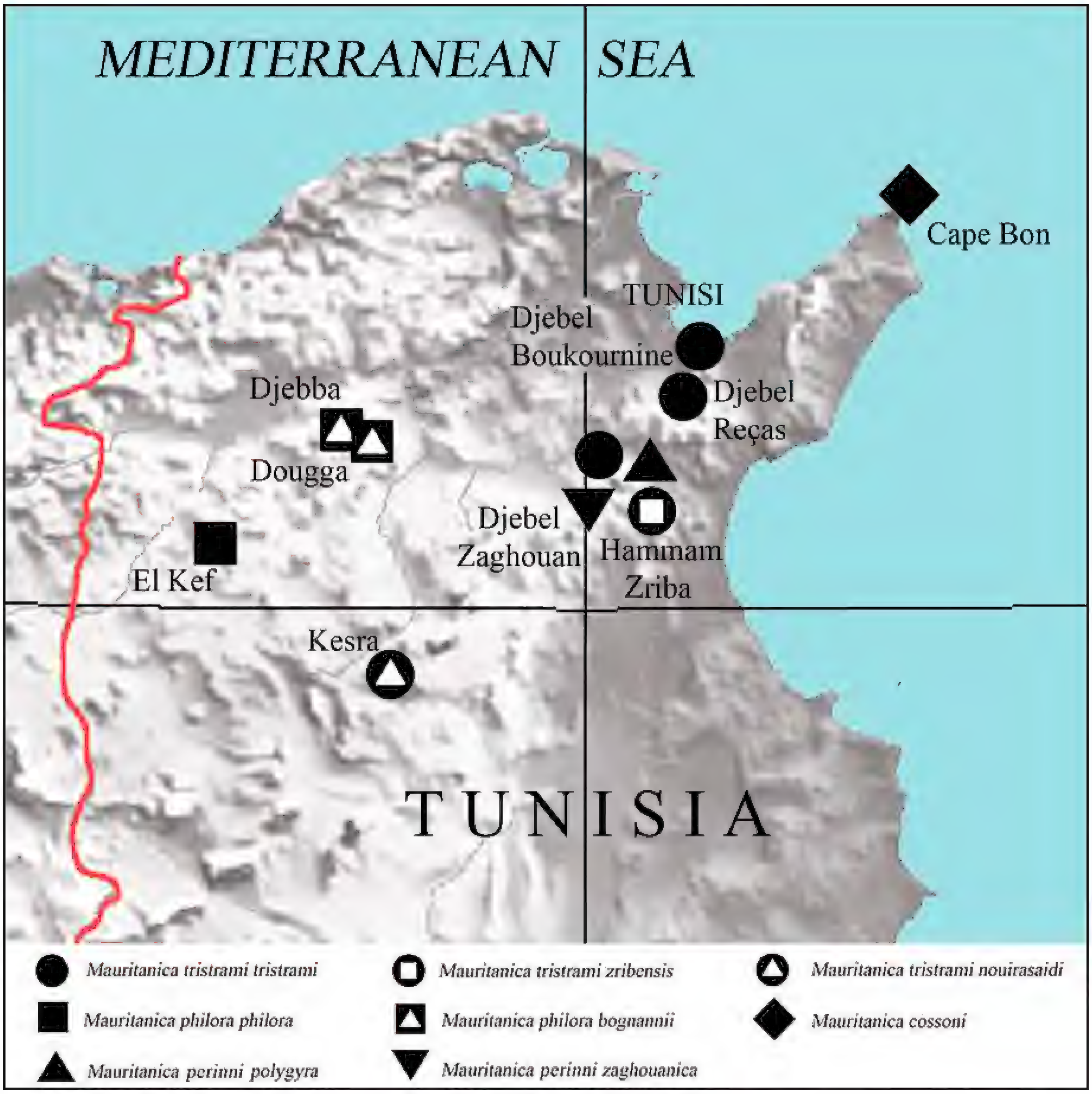
MEDITERRANEAN SEA
Cape Bon
TUNISI
Djebel Boukournine
Djebel Reças
Djebba
Dougga
El Kef
Djebel Zaghouan
Hammam Zriba
Kesra
TUNISIA
● Mauritanica tristrami tristrami
Mauritanica tristrami zribensis
Mauritanica tristrami nouirasaidi
■ Mauritanica philora philora
Mauritanica philora bognannii
◆ Mauritanica cossoni
▲ Mauritanica perinni polygyra
▼ Mauritanica perinni zaghouanica

Figure 82. Distribution map of *Mauritanica* in Tunisia.

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